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THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—11TH YEAR. SYDNEY: SATURDAY, JUNE 21, 1924. No. 25.

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NOTES AND EXPERIENCES IN RADIUM THERAPEUTICS.[1]

By CHARLES E. DENNIS, O.B.E., M.D. (Melbourne),

Honorary Radiologist, The Women's Hospital, Melbourne; Honorary Radiologist to the Eye and Ear Hospital, Melbourne; Honorary Clinical Assistant to X-Ray Department, Alfred Hospital, Melbourne.

THE terms radium therapy and emanation therapy are apt to be misleading and confusing to those who have not studied the chemistry of radium and its medical application. There is really no difference strictly speaking between the action of the salts of radium and that of the radium emanation. In both cases the useful β and γ rays are given off by the active deposit or disintegration products of the emanation which contains radium B. and radium C. *et cetera*. In so-called radium therapy the applicators contain radium salt (bromide or sulphate) *plus* emanation *plus* radium B. and radium C., the latter being the *fons et origo* of the useful β and γ rays.

In radium emanation therapy the applicators contain merely the emanation *plus* radium B. and radium C.. Separate the emanation and its active deposit from the radium salt and the latter is inactive till such time as fresh emanation and radium B. and radium C. are produced. Thus we see that radium treatment is due in each case to the presence of radium B. and radium C.. The difference is merely in application and results are the same for the same dosage. The latter is easily calculated for the radium salt, as its strength does not vary from year to year or from day to day, as in the case of emanation.

The advantages of the emanation over radium salts consist in the following: (i.) The stock of radium from which it is drawn, can be left safely in a cellar in a lead-lined steel receptacle and is in no danger of being lost. (ii.) If a tube of emanation be lost it can be replaced with little loss of time and no loss of capital. (iii.) It can be put up in the tiniest capillary glass tubes or "seeds" of a strength equal to that of from one to two milligrammes for distributing in and around growths or in applicators of any strength up to the maximum amount available. (iv.) Applicators can be devised to suit each case. However, it must be remembered that to provide a more or less continuous supply at least a stock of five hundred milligrammes of radium element is necessary in the reservoir.

Thus the expense to a private individual who wished to provide his own emanation, would be very high, especially as, in addition to the radium supply, the collection of the emanation, standardization of the applicators *et cetera* would necessitate

[1] Read at a meeting of the Victorian Branch of the British Medical Association on May 7, 1924.

the cooperation of a physicist and possibly an assistant and much expensive apparatus.

Therefore, if emanation is to be made available, some form of institute is required, where medical men could bring patients for treatment under the advice of those with expert knowledge. To get satisfactory results and to avoid doing harm in using radium requires special knowledge and, if emanation is to be obtained by those unacquainted with its use and dangers, much harm may be done. Also it is impossible for the expert to advise if a patient is suitable for treatment and, if so, what dose is required and how to apply it, if he has not seen the patient. It would be like "buying a pig in a poke," with the patient as the unfortunate purchaser.

For superficial dermatological uses the radium applicators are better suited than emanation tubes as they are always ready and dosage can be repeated without the preparation of fresh applicators *et cetera*. But for treating malignant conditions emanation tubes have usually many advantages, especially where they can be inserted into and round the growth. The small seed tubes of from one to two millicuries strength can be inserted all round and through the tumour and left permanently, the tiny glass tubes causing no inconvenience when the emanator has exhausted itself. For instance this may be done in such places as in the tongue, floor of the mouth, in rectal conditions and in the prostatic region *et cetera*. The metallic tubes containing radium salts can also be embedded, but are bulkier and require removal and are more difficult to space evenly.

Radium in Gynæcological Conditions.

In gynæcology emanation tubes are useful, but I think that solid radium applicators are as a rule equally satisfactory.

The greater part of my experience of radium therapy in gynæcology has been in patients suffering with carcinoma of the *cervix uteri*, though I have also treated patients with menorrhagia and one with inoperable myoma. At the Women's Hospital and in private practice I use one hundred milligrammes of radium bromide and in private I often combine X-ray and radium treatment in malignant conditions. I am sure in these cases the result is better than when radium alone is used.

In malignant disease of the cervix there are occasionally seen patients who appear quite well after some years, still it is my experience at the hospital and I think the usual one, to find that patients who appear well for six months or twelve may be, often develope secondary glandular metastases in the pelvis beyond the area of effective raying by the radium. My experience is that in inoperable carcinoma of the cervix radium treatment gives wonderful palliative results, with in some instances clinical disappearance of the condition for some years and that when X-rays are used in conjunction with radium, the results are still better.

In THE MEDICAL JOURNAL OF AUSTRALIA, July 8, 1922, there is an article by me on my experiences of radium treatment of carcinoma of the *cervix uteri* at the Women's Hospital, Melbourne, and to this I have little fresh to add. The points to be noted in it are: That all the patients treated by me who were not operated on, were frankly inoperable and many had definite involvement of the broad ligaments. In practically all there followed improvement for varying periods, manifested by cessation of pain when present, diminution or cessation of discharge, loss of fetor, cessation of hæmorrhage and disappearance of difficulty and pain on micturition and defæcation. Health improved with improved appetite, better sleep and gain in weight. In two instances in which the uterus was removed after treatment and examined by pathologists, no trace of malignant disease was detected, though its presence had been previously demonstrated. The great disadvantage of the use of radium alone is the impossibility of controlling the pelvic glandular metastases. This, however, can be partly remedied I hope and believe by the combined use of X-rays from the abdominal route, but in this method care must be taken not to cause overdosage with injury to the rectum and bladder.

So far I have not had any ill-results save some slight temporary pain in one or two sensitive patients.

The insertion of radium needles and emanation tubes into the broad ligaments *per vaginam* has not met with much success and there is an added danger of causing damage to the ureters. Possibly the insertion of these by the abdominal route under vision might be more successful. In menorrhagia with subinvoluted uterus or without definite detectable cause I have had good results by placing eighty milligrammes in the cervical canal or forty milligrammes in each lateral vaginal fornix filtered with 1.5 millimetres of brass and in the latter case one millimetre of aluminium covered with thin rubber.

In the case of the myoma referred to it was found at operation impossible to remove the uterus as the bowel was adherent too extensively to its surface. The uterus extended nearly up to the umbilicus and was wedged in the pelvis causing pain and difficult defæcation *et cetera*. The patient had had two applications of radium in the vagina and two applications of X-rays to the abdomen and now the uterine mass has shrunk down wonderfully and was still becoming rapidly reduced in size when I last saw her.

Papillomatous Epithelioma of the Vulva in a Diabetic.

A patient had a painful papillomatous mass involving the whole vulva causing her pain when she sat down. It was beginning to ulcerate and was quite inoperable and she had urine heavily loaded with sugar. On account of the diabetes I gave her relatively small doses of heavily filtrated radium and the mass simply melted away and she is, I believe, still quite free after a couple of years.

Radium in Recurrent Carcinoma of the Prostate.

A patient, a returned soldier, had had a carcinomatous prostate removed. He had two nodular

recurrences at the base of the bladder and and suffered intense pain on micturition. Dr. Gordon Shaw induced sacral anæsthesia and we inserted four radium needles on long handles into the perineum. Each needle contained twenty milligrammes of radium bromide and the needles were guided into position with the index finger in the rectum. They were spaced about one cubic centimetre apart and left *in situ* for six hours with a 0.45 steel filtration. The following week eighty milligrammes were inserted in the rectum with a filtration of 1.5 millimetre brass and two millimetres of rubber for eight hours. He improved rapidly and in six months seemed quite well, though some thickening could still be felt. He had no rectal irritation and said he would be willing to have it done again if he had any trouble. I have not heard of him since.

Radium in Dermatological Conditions.

In dermatology I have had excellent results in the following conditions during nineteen years' experience of the use of radium.

Verruca Vulgaris.

Large isolated warts disappear after a small dose usually without the production of erythema and leave no trace.

Moles.

Moles are far more resistant. If hairs are present, when these are destroyed great improvement is seen, but it requires great care to avoid too large a dose with subsequent scarring. As a rule excision is probably better, if the mole is not too large. In flat pigmented moles in the very young excellent results may be obtained, but it requires time and patience to cause an even disappearance of the colour and not to leave a blotchy result and overdosage must be as carefully avoided or the result may be as bad as the original blemish.

Keratosis.

The senile and seborrhœic keratoses so common in this country respond in a most gratifying way to a mild erythema dose of unfiltered radium. When ulcertion is present or even when epitheliomatous changes appear, these almost always yield rapidly to lightly filtered doses. These patients in my practice form the largest class and are very satisfactory to treat. The epitheliomata following this condition are as a rule fairly superficial and do not tend to cause gland involvement. When, as is occasionally seen, however, there is infiltration of the base of the epithelioma, doses up to one thousand milligramme hours should be given with filters of 1.5 millimetres of lead *et cetera.*

Rodent Ulcers.

Rodent ulcers are usually satisfactory to treat and I have rarely ever been disappointed unless involvement of bone and cartilage was present. With respect to those about the lower eyelid it is necessary to note after the ulcer has healed that there is no subcutaneous thickening, as in this situation I have seen it develope several times. It requires a much more energetic treatment. Recurrences after operation also require more vigorous treatment and seem more resistant.

Lupus Erythematosus.

In some of the more chronic scaly forms of *lupus erythematosus* excellent results follow treatment which should extend beyond the affected area, but should not produce more than a mild erythema. Other varieties do not benefit. Strong dosage is to be avoided.

Psoriasis.

Radium is sometimes useful in isolated stubborn patches of psoriasis, but dosage should be very mild—half an erythema dose repeated if necessary. Patches are very susceptible to radium treatment, but it is rarely necessary to use it.

Chronic Eczema and Lichen.

Chronic eczematous and lichenified patches respond well to mild dosage.

Acne Keloidal Scars.

In isolated acne keloidal scars several applications will cause absorption and flattening of the scar, but as a rule in the more extensive cases X-rays are to be preferred.

Hypertrophic Scars and Keloids.

Hypertrophic scars and keloids, especially when of not too long duration, give great satisfaction. The dosage depends on the age and toughness of the scar and its elevation.

Nævus Vascularius.

No condition that I know gives better and more pleasing results than *nævus vascularius* in children, except the very widespread and very superficial type.

Of all the patients I have treated I cannot remember any that have not given me more or less complete satisfaction. I have seen patients up to thirteen years later and the only case in which telangiectasis followed was one in which a large nævus of the back was ulcerated when the patient was sent to me.

Recently I had a case of deep cavernous angioma of the orbit (really not a dermatological condition) without any skin involvement. There was bulging of the upper lid and some dislocation downwards of the eye. The patient was a child two years old. The condition had been treated I think seven or eight times by electrolysis without any benefit. Now the swelling is not one-third of what it was, the eye is level with the other and the condition greatly improved. Treatment has been given at monthly intervals through filters of 0.5 millimetre of steel and two millimetres of rubber. Only slight erythema was produced once. I did not like to use heavier filtration and larger dosage in this situation for fear of damaging the eye. In the absence of radium I do not see how the condition could have been relieved seeing that electrolysis was useless. In nævus in bodies of children small doses only at long intervals are necessary and I never produce more than the faintest erythema and do not think even that is necessary. To this I attribute my excellent results. In after years the skin assumes an almost completely normal appearance and the

site of the nævus is not visible to the ordinary observer.

Other Conditions.

I have had good results also in *xanthoma palpebrarum, pruritus ani,* fissured lips, keratoses of the lips, leucoplakia of the lips and tongue, plantar warts *et cetera.*

Conclusion.

I apologise for the sketchy nature of this paper, but further elaboration is impossible owing to the time limit set for each speaker.

RADIUM EMANATION.[1]

By H. FLECKER, F.R.C.S. (Edin.),
Honorary Radiologist, Austin Hospital, Melbourne.

THE purpose of these notes is to draw attention to the special therapeutic value of radium emanation, particularly in the treatment of malignant disease, and to point out its advantages as compared with radium in the hope that sooner or later steps might be taken to add this most valuable agency to our armamentarium in dealing with that ubiquitous and distressing malady which often so completely baffles all our combined skill and resources. As radium emanation has not yet been used in Australasia, we are compelled to rely for information upon experiences which have been recorded elsewhere. I therefore specially disclaim any experience whatever in connexion with this particular element.

Radium emanation is a gas which is constantly formed from radium element or its compounds at a fixed rate which cannot be altered by any known physical or chemical means. This gas is an element of lower atomic weight than radium. It has been called niton and was more recently renamed radon by the International Committee on Chemical Elements, 1923.(1) It is a disintegration product of radium, from which an atom of helium gas has been shot off, such atom being in reality what is known in physics as the α ray. These α rays or more correctly α particles are of little value therapeutically owing to their feeble penetrating power. Both radium and radium emanation owe their therapeutic activity to the presence of β and γ rays, neither of which come off in any considerable quantity from these substances themselves, but principally from their further disintegration product known as radium C., a distinct element of still lower atomic weight. It is evident therefore that the therapeutic effects of radium and radium emanation are identical.

Radium emanation is prepared from radium after time has been allowed for its accumulation by means of a pump which drives the gas into special tiny receptacles, usually made of glass, but more recently some material soluble in the body tissues has been used for the purpose. The life of this gas is very limited as it decays to half its strength in 3.8 days, that is, it loses 16% of its value daily. This process is perfectly regular so that curves are available, giving respective values after the lapse of any desired period. Roughly we can say that the life of radium emanation is about five days. After collection it is a comparatively simple process to measure the activity of this gas by the aid of an electroscope. This is expressed in terms of millicuries. A millicurie is that quantity which remains in equilibrium with one milligramme of radium, that is the energy given off by one millicurie of emanation is identical to that given off by one milligramme of radium.

Generally one millicurie of emanation is required to irradiate one cubic centimetre of tissue.

Advantages over Radium.

The advantages of radium emanation over radium are many and can be summarized thus:

Adaptability of Form.

Receptacles can be made of any shape or form to suit the particular requirements of the lesion it is proposed to treat.

With radium this cannot be done without serious risk of loss of this most costly substance owing to the necessity of enclosing it in special containers called plaques or needles, the shapes of which are not adaptable to any considerable extent. Thus a circular surface lesion cannot be treated to best advantage either by a square plaque or by a series of needles.

Adaptability of Dosage.

Any specially desired dose, according to requirements can be prepared, even minute doses when it is of advantage to treat a lesion with numerous scattered "seeds" and thus secure a very much more even distribution of radiation than is ever possible in the usual way by means of radium needles *et cetera.* Individuals and institutions possessing receptacles containing ten, twenty or fifty milligrammes of radium are unable to use any other quantities than those which these needles *et cetera* contain. It can be easily understood for instance that in employing a caustic to a mass of tissue the efficiency would be much greater if such caustic were distributed evenly over numerous depth points, than if applied in one solid lump in the centre.

Compressibility into Smaller Bulk.

That compressibility into smaller bulk is of very great advantage is shown by its application in such situations as the larynx. Freer(2) sums up that up to four hundred millicuries of emanation can be condensed into a sealed glass capillary tube eight millimetres long, although fifty to one hundred millicuries is the usual amount. These emanation tubes are enclosed in little silver enamelled tubes, sixteen millimetres long and 0.8 millimetre thick, placed for use in small silver containers called screens which are made to hold from one to six enamelled tubes. Thus a four tube screen may contain even sixteen hundred millicuries of emanation giving the utmost irradiating power in the least possible space. In contrast to the compactness of emanation, the container for only thirty milligrammes of radium

[1] Read at a meeting of the Victorian Branch of the British Medical Association on May 7, 1924.

is already too large for the larynx, filling it up, yet giving an ineffectively feeble irradiation.

Lack of Necessity for Removal.

In cases where the implantation is made directly into the tumour mass itself owing to the rapid decay, roughly within five days, there is no necessity for the removal of the bare tubes. The glass receptacles being very small do not cause any inconvenience and may slough out. Schmidt,[3] however, reports the use of a material which is absorbed by the body tissues. How useful this fact may become is indicated in intra-abdominal lesions, where the emanation is placed in position at the time of a laparotomy and the abdomen closed up in the usual way. There is then no need to remove the tube.

Emanation tubes are usually inserted into the depth of a growth by means of specially constructed trochar needles.

Lack of Great Monetary Value.

From a practical point of view lack of great monetary value is its greatest advantage, for it is chiefly on account of its great cost that radium is quite unobtainable by the majority of patients whom it would most benefit. In Europe, in America and even in Japan radium emanation is regularly dispatched under expert supervision and advice by post all over the country wherever it is required for either therapeutic or experimental purposes, and there is no reason why a similar supply should not be available throughout Victoria and Tasmania, as well as to the nearer parts of South Australia and New South Wales from a central depôt situated somewhere about the vicinity of Melbourne. The scarcity of radium was well illustrated by a report published last year, that of the nine chief metropolitan hospitals about Melbourne, all of which deal with patients who would be benefited by radiotherapy, five had absolutely no supply whatever, whilst the remaining four did not have more than the equivalent of one hundred and fifty milligrammes of radium element between them, the whole of which in some cases would be inadequate to treat a single lesion! It is stated in the Annual Report of the Radium Institute, London,[4] that the general trend of radium therapy is in the direction of increase of dose, more especially at the first exposure, and the employment of quantities of radium element varying from two hundred and fifty to seven hundred and fifty milligrammes.

During 1923 at the London Radium Institute nine hundred and forty-seven emanation applicators were prepared, whilst from the Manchester and District Radium Institute[5] five hundred and fourteen plates and twelve hundred and eighty-one tubes were made during 1922. These were distributed all over the United Kingdom.

In New Zealand great interest has been shown in this subject, for example at Wellington funds have been raised for the purchase of a whole gramme of radium with which to supply also emanation. Wellington alone will have next month more radium available than exists in all the Australian hospitals combined. Both Dunedin and Auckland will very soon have similar supplies, so that shortly emanation will be available practically throughout the Dominion.

Use as Inhalation.

Emanation can be administered as an inhalation in special chambers known as emanatoria. The dosage is measured as so many emans per litre, ten thousand emans being equivalent to one microcurie. Considerable relief is claimed in the treatment of certain general conditions of disordered metabolism such as gout, rheumatism *et cetera*.

Preparation for Active Deposit of Radium.

The decay products of radium emanation which have been collected on special needles, are known as active deposit and consist of the various substances known as radium A., B., C. *et cetera*. Some of these are intensely radio-active. Brown and McHutchison report success with the use of this agency in such conditions as telangiectatic nævi and *lupus erythematosus*, which ordinarily resist treatment by radium in other forms. However, as yet this method of application has not come into very extensive use, but there is good reason to believe that it may be found very valuable later on.

Radium in Australia.

It may be of interest to know that the largest and richest deposits of radio-active minerals yet known are at two separate localities in South Australia, *videlicet* at Radium Hill and at Mount Painter. The former is being opened up at the present time. The Geological Department of the University of Adelaide under Sir Douglas Mawson is now testing the ores for treatment purposes on a large scale and it is anticipated that in a very short time, the actual treatment of the ores will be carried out.

Conclusion.

I have specially sought this opportunity to bring under the notice of the medical profession in Victoria the deplorable lack of facilities for more effective treatment of malignant disease *et cetera* and if this paper is the means of initiating a movement to overcome this disability, I shall feel rewarded. I would like to see started tonight, for instance, say a notice of motion to the effect that steps be taken to secure not less than one gramme of radium to be made generally available under proper supervision and control to approved bodies or individuals for the purposes of therapeusis or research. This may possibly be done in conjunction with the cancer institute which it has been recently decided to form in Sydney.

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(1) *Journal of the American Chemical Society*, April, 1923, pages 867 to 874.

(2) Otto T. Freer: "Carcinoma of the Larynx Treated Locally with Radium Emanation," *The Journal of the American Medical Association*, November 4, 1922, page 1602.

(3) Schmitz: "Study of the Action of Measured Radiation Doses on Carcinomata of the Uterine Cervix," *American Journal of Roentgenology*, October, 1923, page 781.

(4) Radium Institute, London, Annual Report, *The British Medical Journal*, February 23, 1924, page 344.

(5) Manchester and District Radium Institute, Annual Report, *The British Medical Journal*, August 4, 1923, page 204.

(6) W. H. Brown and J. P. McHutchison: "A New Technique in Radium Therapy," *The Lancet*, February 9, 1924, page 309.

RADIUM THERAPY.[1]

By R. R. WETTENHALL, M.B., B.S. (Melbourne),
Honorary Dermatologist, Children's Hospital, Carlton, Melbourne.

THE object of this meeting tonight, I understand, is to stimulate interest in supplies of an adequate amount of radium for use in Victoria. What that amount would be cannot be determined, but at least a beginning should be made.

Those who are in touch with recent work with radium, do not need stimulus in that direction.

First the profession at large should be acquainted with the advantages to be derived from radio-therapy, then we may hope for the provision of a well equipped institute permanently devoted to radio-therapeutic measures.

To be of the greatest value all adjuncts to radium therapy should be available including surgery or any other suitable treatment and in that way the special advantages of one or other mode of treatment would be demonstrated.

Very great advances have been made in technique of radium applications in the past few years and this has largely been brought about by the use of radium emanation apart from radium itself. In addition research is constantly going on in the physical laboratories connected with these hospitals and institutes where the work is done.

While away last year I had the privilege of visiting and being shown over a number of such special institutions. At Baltimore, Dr. Howard Kelly has a large hospital in which he has five grammes of radium at his disposal, and it was very interesting to see the collection of emanation and the mode of application in the various cases.

The daily output of emanation gave the equivalent of seven hundred and fifty millicuries and with this large amount much excellent work was being done in conjunction with surgery or not as necessary.

At the Memorial Hospital in New York, Dr. Douglas Quick is in charge and a great deal of excellent work is being done there. In connexion with it is the physical laboratory where several physicists are at work.

Both here and at Dr. Kelly's Hospital at Baltimore a number of students under direction of competent people help to collect the emanation and thus avoid one person being over-exposed to the rays of radium.

Dr. Failla is the physicist at the Memorial Hospital and is consulted frequently by those who wish to install a plant for collecting radium emanation.

At Boston, again, there is a fine institute, the Huntington Memorial Hospital, in which Professor William Duane, of Harvard University, controls the physical part of investigations and Dr. Greenough is the visiting surgeon.

Here, too, X-rays are investigated as well as radium and a number of other medical practitioners and students are at work.

The surgeons decide as to which patients are suitable for radium therapy and also the dosage and in consultation the best methods of application are decided.

At Chicago Dr. F. E. Simpson has a fine installation for radio-therapy.

At Philadelphia again Dr. William Clark, who is the authority on diathermy, also uses radium and X-rays.

Dr. Pancoast has a fine department in the University of Pennsylvania Hospital.

I was fortunate enough to see the collecting of emanation at Dr. Howard Kelly's Hospital through the courtesy of Dr. Curtis Burnham and also saw the emanation in use both at a distance from the tissue and interstitially at the various institutes.

The amount of radium in use varied from one to five grammes, a smaller quantity than one gramme hardly warranting a large staff with all the necessary apparatus and attendance.

The efficacy of treatment is being steadily advanced and knowledge of the limits of usefulness more and more clearly defined.

There are many other institutions and individuals using radium in America, of course, but the above mentioned are equal to, if not in advance of any others.

The Lister Institute in London is somewhat similarly carried on and preparations of radium emanations are made up and despatched to medical practitioners from the Lister Institute.

From this it is obvious that not only has an adequate supply of radium to be obtained, but an adequate staff, suitable building and committee of management to provide properly for the use of radium. It would be advisable, then, not only to interest the medical profession, but also the general public in the need for such provision. The Charities' Board, university authorities and hospital committees come to my mind as likely to be directly interested.

In looking back over the last seventeen years, when I first saw Wickham, of Paris, applying radium to nævi, the advance in the use of radium is nothing short of wonderful. Most of the advance has been in estimating dosage and improving methods of filtration and application. Where advance may now be hoped for is in the description of the nature of the tissues most susceptible and how to recognize them clinically. The lesions and pathological tissues must be described as well as the general description of the patient in whom they occur.

This is a very difficult procedure and is one of the main factors against distributing emanation to medical practitioners inexperienced in its use.

One of the lessons most outstanding in past work is to avoid over dosage. It is so easy to go on applying radium when the lesion present may be due to previous action. Once recognized, it should not recur.

Another lesson is the difficulty of dealing with a rodent ulcer when involving bone. There is hope of this difficulty being surmounted.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on May 7, 1924.

The question of stimulation of malignant growths is often brought forward. In my experience, as well as that of many others competent to judge, this is extremely rare, if happening at all.

Pain from application of radium is also very rare in dermatology at least.

One of the disadvantages from the cosmetic point of view is the possibility of telangiectases occurring in the site of treatment. This, too, should be avoided.

Then in practice the use of radium requires considerable knowledge of the dosage necessary to remove the various conditions encountered. The dosage depends largely on the depth to which penetration is required and also on the nature of the tissue involved. A similar lesion to all appearances in one person's skin may disappear much more easily than in another's.

When radium is mentioned with reference to treatment of diseases, malignant conditions are nearly always first thought of, but its usefulness is by no means confined to malignancy. Possibly in dermatology it is specially used for early rodent ulcers and keratoses, as it is so satisfactory in such conditions, also because in Australia these lesions are especially common. Other conditions in which it is especially useful, are various nævi and angiomata. The hairy papillary type of nævus does very well, also the deep angiomata. The earlier they are treated the better. Hæmo-lymph-angiomata respond well, so also do leucoplakia and keloid, particularly the latter in conjunction with surgery. Then painful papillomata, met with not uncommonly in the feet and hands, respond very well to treatment from radium. The more fibrous the tissue is in a lesion, such as a scar after injury, the less responsive to radium, also there is evidence that the more actively dividing the cells of the tissues are, the more susceptible they are to radio-therapy.

In looking through the bibliography of radium the amount of investigation that has taken place in practically all branches is immense, but some conditions seem to me well worth further investigation.

The use of radium in connexion with X-rays, surgery or diathermy or other methods must be of value in many conditions which spring to mind. One might class these conditions in five ways: (i.) Cases in which radium should not be used, such as sebaceous cysts in the scalp; (ii.) cases in which radium might be used, but in which other methods are better, such as spider nævi; (iii.) cases in which radium can be used in conjunction with other methods, such as extensive fungating malignant growths; (iv.) cases in which it is best to use radium though other methods might do, such as keratoses and early rodents; (v.) cases in which nothing else would have acted, such as infiltrating malignant conditions of the tonsils and other parts, inoperable conditions generally and multiple rodent ulcer.

By carrying on in some such way we should gradually place radio-therapy in a much more satisfactory position.

There can be no question about the value of radium as a therapeutic agent and the advisability of having a well equipped institute where investigations and treatment can be carried on together.

I very much regret the absence from Victoria of Dr. L. J. Clendinnen who of course is very interested in these subjects.

We owe a great deal to his father, the late Dr. Clendinnen, and Dr. Herman Lawrence for the enterprise they showed in obtaining specimens and working with radium so soon after its discovery.

Now an effort is required beyond the powers of any one individual and the best way to deal with the situation must be found.

I suggest that a meeting be convened of all those interested in this project.

ON PELLAGRA: WITH AN ACCOUNT OF A CASE.

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HAVING to record a case which I believe to have been one of pellagra, it seems to be desirable under the circumstances to accompany the record with some account of the disease and of the theories as to its causation.

Pellagra is usually an endemic disease. It is characterized by symmetrical skin lesions, chiefly of the exposed parts of the body, by gastro-intestinal disturbances and by changes in the nervous system. Stomatitis is often present. The disease is generally chronic and terminates in recovery, insanity or death.[1] In some cases the skin manifestations may occur for a few weeks every summer for two or three years before the disease becomes chronic and incurable.

There have been many theories as to the ætiology of the disease. Some of the older writers regarded it as a peculiar sort of sunburn producing pernicious internal effects. Others both in older times and in recent years have attributed it to bad hygienic surroundings. But the great majority of writers during the past one hundred and fifty years have connected it with faults in the dietary, though there have been many different theories as to what the fault was. It has everywhere been noticed that the disease seemed to be confined to countries and districts where maize was used as an important part of the dietary. The opinion, therefore, arose that maize was the cause of pellagra, but there have been two main theories as to the way maize became responsible. According to one of these, it was due to the consumption of maize spoiled by fungoid growth which had toxic properties. This theory was adopted about fifty years ago by Lombroso, the famous Italian psychiatrist and criminologist, and it was supported by what were supposed by Lombroso and others to be convincing experiments. For many years the theory so strongly advocated by Lombroso was accepted as authoritatively proved, but it is now abandoned by scientific students.

The second maize theory was that this foodstuff, as used for human food, lacked something that was required for perfect nutrition and therefore people who used it as a principal constituent of the dietary, were liable to suffer from a form of malnutrition which became manifested in many cases as pellagra.

There have been also many who have conjectured that pellagra was an infective disease, perhaps one dependent on a primary interference with nutrition and mixed more or less with the effect of bad hygienic surroundings. Dr. L. W. Sambon in 1905 put forward an ingenious conjecture that pellagra might be an insect-borne parasitic disease. His hypothesis was greatly fancied by many, but it was found as time went on that it could not be supported by evidence and it is now abandoned.

During the past twenty years, knowledge about the function of protein in nutrition has greatly increased. A new era began in 1906 with the discovery by Willcock and Hopkins of the fundamental importance of tryptophane.[2] It became plain that distinctions had to be drawn between different proteins in regard to their nutritive function and this was seen to depend on their amino-acid make-up. One amino-acid could not do as well as another. Though in some cases one might be used to replace another, each important "building stone" held a key position and imposed a "law of the minimum." A deprivation of any one of these involved in the end a physiological calamity. Certain proteins have been shown to lack certain amino-acids or to contain them in proportions too small for physiological needs. Thus gelatine lacks lysine, cystine and tyrosine and since the protein basis of ordinary soup-stock is gelatine, there is a ready explanation of the often-recorded disasters that have followed charitable efforts to support the nutrition of poor and starving people by soup. Bean protein (also casein) has been found to contain a scarcely sufficient quantity of cystine. And lastly, zein, the protein of maize flour, has been found to contain no tryptophane and no lysine.

A dietary restricted to maize meal, especially if highly refined, would have no lack of fuel units, but it would contain extremely little and quite inadequate calcium and equally inadequate iron. It would be practically devoid of vitamin A., vitamin B. and vitamin C.. And lastly, it would contain no tryptophane and no lysine. These deficiencies would be made good if a sufficient quantity of fresh green leaf vegetables were added. The protein, if that were the only deficiency, could be made satisfactory by such materials as milk, eggs or liver. But the best would be a good mixed dietary, including the green vegetables, for milk is low in iron and not always rich in vitamins B. and C. and eggs and liver are poor in calcium.

Not all this was known in 1914, but from about that year the attention of investigators became more closely drawn to the dietary deficiencies of pellagrins and especially to the protein deficiencies. From that time onwards, evidence has accumulated which tends very stongly to show that among other deficiencies that of essential amino-acids plays a predominating part in the production of pellagra. Goldberger, Wheeler and Sydenstricker and others in America have done much to strengthen this view.[3] From Egypt, a very impressive paper on the subject was published in 1921 by Wilson[4]. Wilson's paper tells strongly in favour of amino-acid deficiency as the chief factor in the production of pellagra.

Summed up, the present evidence is certainly to the effect that pellagra is a deficiency disease, the privation being firstly of tryptophane, secondly of lysine, but combined with other deficiencies. These other deficiencies are those I have enumerated in connexion with maize flour. The fact that the deficiencies are complex may serve to account for some of the clinical variations. It may be added that a deficiency theory by no means disallows the possible existence of metabolic poisons, produced by failure of detoxicating mechanism or otherwise, nor does it forbid infective complications induced by failure of physiological resistance.

The Symptomatology of Pellagra.

No attempt of my own at rendering other people's experience second-hand could have the value of a description in the words of a man of large personal acquaintance with the disease. I need not apologize, therefore, for using the following extracts from Wood's "Treatise on Pellagra."[1] I have, however, omitted descriptions of nervous and mental symptoms, since they are not apposite to the particular case I am bringing forward.

"The only feature of the skin manifestations of pellagra that is really distinctive is the symmetry. The character of the skin condition itself may suffer many variations, but symmetry never fails. . . . This symmetry is not restricted to the location of the patch of erythema; it also includes symmetry of size and shape. If a pattern of the skin lesion were made of one side it would be found to conform exactly in most instances to the lesion of the other side. . . . It seems that to complete this picture of perfect symmetry the action of sunlight must be added. In the lower extremities the sun seldom having any direct action, the erythema is not so well defined, either as to symmetry or to the sharpness of the line of demarcation between normal and diseased skin. . . .

"The erthyema of the backs of the hands may occur as round spots about the size of a half-dollar, which are separated by areas of normal skin. In other cases the area of skin is more spread out, covering the entire back of the hand. . . . The lesions of the fact are of two kinds. In one, the so-called pellagrous mask, the skin is diffusely affected. In the other the lesion occurs in isolated patches separated by normal skin. . . . The diffuse type limits itself to the portions uncovered by hair. . . . The extent of the skin involvement differs in different cases. In all cases in this locality the symmetry is especially well marked and there are no exceptions. The most usual location is the ala of the nose, after this the other portions of the nose, then the forehead, cheeks and chin. . . . My own cases have more commonly shown a tendency for the formation of spots of erythema. One of the favourite locations for these spots is the outer canthus of the eye. . . . Merk says that the degree of erythematous redness of the face is not often extreme and may be easily overlooked. . . . The attention is usually not directed to it until after defervescence, when the brownish pigmentation marks the location and extent of the previous erythema. But even these secondary changes may be so inconspicuous as to be overlooked. . . .

"The character of the skin lesion *per se* is the least important feature and cannot be depended on in arriving at a diagnosis. It is subject to a number of variations of an indefinite character. . . . The lesion of pellagra is usually referred to as an erythema, but this term must of necessity be used in a very broad sense to include all classes of cases. There are probably just as many cases which should rightfully be classified under the term dermatitis.

"The first change noted is often distinguished with great difficulty from sunburn. . . . In a large experience I have never developed such skill that I could differentiate a recent sunburn from a recent attack of pellagrous erythema. . . ."

Wood quotes Howard Fox, from the *Medical Record*, of February 5, 1910, as follows:

"The name erythema, by which the eruption of pellagra is generally denoted, does not appear to me to be entirely appropriate. It would seem quite proper to use the term erythema for the first stage of the disease which resembles an ordinary sunburn and which lasts only a few days. But it seems somewhat anomalous to speak of the entire eruption as an erythema when the erythematous stage is so comparatively insignificant, while the stage of desquamation is so characteristic and of such long duration."

Wood continues his description as follows:

"*'Wet' Pellagra.*—It is largely to the American observers that the division of pellagrous skin lesions into two great groups is due. These are the 'wet' and the 'dry.' After a varying interval of time there is superimposed on the erythema the formation of blebs which neither in form, appearance nor size possess any features peculiar to pellagra. Again we see a marked similarity to solar erythema. . . . The seat of these blebs is usually the backs of the hands, less frequently the neck and in some of my cases in children the legs and feet. It is not infrequent that the contents of the bleb becomes contaminated from the outside with a resulting pus formation. . . . The skin between the blebs is seldom normal. The bleb merely arises from a portion of the erythematous surface.

"*'Dry' Pellagra.*—Hyde describes the 'dry' lesion thus: 'The hue of the exanthem differs according to the colour scheme of the subject and the length of time during which it has existed. At first the colour is a dull red which has been likened to the appearance of the skin after common sunburn. The pellagrous erythema . . . is more reddish than pinkish, displayed at times with discrete macules which speedily fuse and produce, on the backs of the hands, for example, a uniformly smooth, reddened and distinctly outlined area. . . . As the evolution of the erythema advances, the colour deepens. . . . The first eruptive symptoms may disappear in a fortnight with epidermic exfoliation in light flakes, leaving behind a pigmentation differing according to the severity of the precedent engorgement. In most of the first attacks the eruptive phenomena fade in a fortnight.'

"Quoting from Merk: 'It is days or even weeks before the eruption reaches its height, and even a longer time is needed for its retrogression. . . By its external characteristics the erythema is strongly allied to the so-called hyperkeratosis. But it may show enormous exudation, especially on the backs of the hands.'

"*Constipation in Pellagra.*—I have observed the most obstinate constipation in pellagra. Its occurrence is a rarity. . . . Roussel found that it was not altogether infrequent, especially in the early stages. It often alternates with diarrhœa.

"*Diarrhœa in Pellagra.*—Strombio, the elder, distinguished the dysenteric type of diarrhœa which was characterized by frequent muco-sanguinolent stools and colicky pain and which was often seen in the early stages; the other type was the ordinary form of diarrhœa so well known to all who have seen any of the disease which is characterized by frequent watery stools and which cannot be checked. It is a notable fact that this diarrhœa will resist even large doses of opium and never ceases under any form of treatment until the disease abates. . . . It has been stated that there is a peculiar odour to the stools in pellagra and certain writers think that in some cases a diagnosis may be made from this alone. I have often been forced to endure this odour and I think in some instances it may be characteristic, but it is as unsafe to rely on it as it is to rely on the characteristic odour of typhoid fever.

"*Stomatitis in Pellagra.*—In the series of one hundred cases of the pellagra report of the Illinois State Board of Health it will be noted that mouth symptoms occurred in seventy-two of the cases, hence the percentage without was twenty-eight. This is quite different from my own experience and shows the variation of pellagra in different localities. In my series, in only 5% of the cases was stomatitis absent. . . .

"*Nervous and Mental Changes in Pellagra.*—Probably there has been a greater death rate from pellagra in individuals manifesting no nervous symptoms than otherwise. Such has certainly been my experience and has been borne out by my autopsies. . . . These changes are the result of repeated attacks on the nervous system. It is only rarely that one attack is sufficient to produce demonstrable effects on the nervous tissue.

"The time of the appearance of mental symptoms in pellagra is subject to all possible variations. The reader will recall the case of the grocer who was supposed to be suffering with a symmetrical gangrene of the skin due to malaria which was later found to be pellagra. In this case the mental disturbances antedated all other symptoms by many weeks. On the other hand I recall the case of an old man who told me that he had been pellagrous for forty years, and yet he was able to make his living as a labourer and manifested absolutely no symptoms of the disease from the mental standpoint."

Description of my Case.

Charles W., aged fifty-three years, was admitted to the Sydney Hospital on October 9, 1923, with a history of paroxysmal cough excited by lying in certain positions and accompanied by periodical ejection of a copious, very foul-smelling, watery sputum. This contained hooklets. He was in an extremely emaciated condition and gave his weight as 37.8 kilograms (six stone), though he was not weighed in the hospital at that time. I had operated on him two years before for hydatid of the liver by the epigastric route.

I diagnosed the condition as one of hydatid of the liver which had ruptured through the lung into a bronchus and had formed a sort of bronchiectatic cavity above the diaphragm. I opened this by thoracotomy on October 25, 1923. The fluid within it contained some dead and collapsed daughter-cysts, but no mother-cyst. The anæsthetic was given by intra-tracheal insufflation and the current of air blew out forcibly through the wound. No opening into the liver could be found, though the presence of daughter-cysts was sufficient proof of its hepatic origin. The patient was in such an extremely weak condition that I thought the addition of an exploratory hepatotomy would add so much to the immediate danger as to make it unjustifiable under the circumstances. I therefore contented myself at the time with inserting a drainage tube, hoping that the original hepatic hydatid would open up later and drain sufficiently through the wound.

After the operation the cough disappeared, the temperature became normal and his general condition improved greatly. The wound drained very freely and the discharge was very foul-smelling.

After about three weeks of improvement he began on November 12, to suffer from diarrhœa. This was regarded as due to absorption of toxic material. A special feature of the diarrhœa was that immediately he took any food it passed through him. Opium and other drugs were quite useless. Nothing seemed able to check the

diarrhœa. Notwithstanding this, he appeared to maintain his regained strength for a while. On account of the very foul odour he was transferred for a period to the isolation cottage. While at the cottage he states that on one occasion (December 5, 1923) he exposed himself to the sun and became sunburnt. Ten days after this (December 15, 1923), the skin on the dorsum of both hands was brownish and slightly scaly. This peeled off and exposed a reddened epidermis beneath. Simultaneously the tip of his nose peeled. On January 3, 1924, the skin on the backs of his hands was again dusky and scaly, without any further exposure to the sun. He was at this time back in the large surgical ward. During the next two weeks the skin of the back of the hands became very much worse, looking like a very severe sunburn. The eruption reached proximally as far as the back of the wrist, but no higher and it involved a portion of the backs of the fingers. The affected skin was covered with bullæ which contained an opalescent or semi-purulent fluid, apparently from an infection. These bullæ burst and the denuded surface exuded fluid exactly as is seen in a burn. The exposed underlying surface was very red. The rash on the nose spread to the *alæ nasi*, but remained dry and dusky red. During the second and third week of January the diarrhœa had become incessant day and night; he reckoned the number of motions at from twenty to thirty per day. During the third week in January the skin lesion was about at its worst. On the face there was now a dusky red rash reaching from the nose on to both malar prominences. Two similar red patches, strikingly symmetrical, were in evidence just below the angle of the mouth on each side, but these areas were not at once so scaly. There were two more symmetrical red patches with well-defined margins in each temporal region just outside the outer canthus, but that on the left side was much redder and acute-looking than that on the right. Another area reached from side to side across the middle of the forehead. It was very distinctly marked off from the patches on the temples. From the *alæ nasi* the eruption reached down along the naso-labial fold as far as the moustache. No bullæ formed on the face. The eruption on the backs of the hands was far more severe in character than it was on the face. It should be emphasized again that all this eruption in January occurred without any further exposure to the sun.

As it had become obvious that he would soon die if the symptoms could not be relieved, on January 24, 1924, I operated on him again and was fortunate enough to find the cavity in the liver. It was about one centimetre or less from the surface, entirely covered by normal-looking liver tissue. It was seven or eight centimetres in diameter—rather less than the length of my forefinger—and was filled with extremely foul fluid. The mother cyst was lying within it in several fragments. No opening in the cavity could be detected by the finger from within. The cavity was evacuated and a tube inserted into it.

During the week following this second operation the diarrhœa improved very greatly, subsiding to no more than two or three motions per day. The patient felt better and gained a pound in weight. The severity of the eruption was much diminished.

The patient was shown at the meeting of the Sydney Hospital Clinical Society on February 14. At that date the backs of the hands were very much improved; the epidermis was red, smooth and shiny over the greater part, but it was desquamating in large flakes. On the face the redness had much diminished. The patch over the left temple had become a more dusky red. With the fading of the redness, the site of the eruption had assumed a dirty brownish tint, giving the face an unwashed appearance in spite of diligent scrubbing with soap and water. This dirty appearance was due to the presence of a coat of desquamated material (hyperkeratosis). Except over the nose, the epidermis on the face did not peel off in coarse flakes. At the date mentioned the two patches on either side at the angles of the mouth were entirely covered with this rough dirty-looking material and the same was very noticeable at the *alæ nasi* and adjacent parts above the line of the moustache. To the touch the whole of the affected areas on the face felt rough like sandpaper, and by touch the margins were more defined at this time than they were to sight. But the area on the left temple was still very well defined to sight and the same applied to the patches below the angles of the mouth. Some diarrhœa was still present.

On February 27, 1924, though there was distinct improvement, the changes were not in themselves great. The redness had disappeared from the left temple, leaving a dirty brown mark. The diarrhœa had ceased. The discharge from the wound was now slight and its odour was hardly noticeable. On March 5, 1924, there was still to be seen some coarse peeling of the skin on the backs of the hands near the margin of the affected area. The central part was clean, smooth and had a pale purplish-pink tint. On the face the dirty appearance was still present about the *alæ nasi*, below the angles of the mouth and on the left temple. To the touch the whole of the affected surface on the face was still very rough, feeling like sandpaper. The dirty brown colour on the face seemed to be due to the hyperkeratosis rather than to any changes in the deeper portion of the skin.

On March 12, 1924, there was no peeling on the hands, but the hyperkeratosis had not disappeared from the face, though it was certainly improving. The characteristic patches were still plainly evident to the touch. Since the last operation he had gone up in weight from forty-one kilograms (six stone seven pounds) to fifty-two kilograms (eight stone four pounds), a gain of eleven and a quarter kilograms (twenty-five pounds) and of this he had gained nine kilograms (twenty pounds) in the previous three weeks.

Discussion.

In interpreting the case I have just recorded there are two sets of facts to coordinate. One concerns the physical characters of the lesions. The other is the historical succession of events and symptoms. As to the eruption, the situation is first noted. It was confined to parts uncovered by clothing and exposed to light, namely the face and the backs of the hands. Next we note the existence of definite patches with margins which at the height of the outbreak were very sharply marked by colour contrasts. Thirdly there is the extremely accurate symmetry of the patches. Nothing could be more striking than the symmetry in the patches below the angles of the mouth and in the temporal regions near the outer canthus. The symmetry applied to size and shape, but on the temples one side was much more severely affected than the other. The diagnostician must take this symmetry into account and fit it, if he can, into a rational diagnosis. It was this that first excited my attention and made me suspicious of pellagra.

We are led next to examine the clinical history. The patient on admission was obviously in a very bad state of nutrition. This means that for some time there had been a want of balance between intake and outgo resulting in emaciation. Certainly this might have been simply a result of deficient intake of fuel units, as compared with the outgo. Such a simple form of malnutrition would be unlikely, but it is imaginable. The reasonable assumption would be that there had been a wider deficiency, but without more particular information we could not say how far vitamins or calcium or protein "building stones" had been specially in-

volved. Still, it establishes the existence of a condition in which it would not be surprising if under relatively slight provocation signs of some special state of depletion were evolved. For instance, pellagra. Here I shall quote Wood again. On page 123 of his book he writes as follows:

"Pellagra shows a strong tendency to attach itself to a victim of any chronic disease whose resistance is lowered. . . . Pellagra attacks the victims of uncinariasis . . . as well as the sufferers from malaria, tuberculosis, alcoholism, poor hygiene, poverty, pregnancy and too frequent child-bearing."

I think the diarrhœa was primarily due to toxic absorption, but we have to note that a special feature of this diarrhœa was its excitation by food. The food seemed to pass through him at once. There must have been very inefficient utilization of the ingested nutriment and if the patient were near the threshold of a physiological bankruptcy in any one element, this form of diarrhœa would become an effective determining cause.

An amino-acid may be present in the food in sufficient quantity, but if the protein in which it is built, is passed through the alimentary canal without being broken down, the amino-acid concerned is lost and the total quantity of it actually received into the body may become too small. This has been experimentally proved in connexion with cystine. Bean protein is low in cystine. Johns and Finks have shown that while cystine must always be added to bean protein to obtain efficient growth in rats, the efficiency of the protein is increased by boiling.[5] There is no doubt that this is because a considerable percentage of the raw protein passes through the alimentary canal without being broken down, whereas a better digestibility is procured by boiling it.

The next point is the history of the eruption. There was a moderate outbreak which we can attribute to sunburn, though it would seem from the turn of events that it was sunburn in a specially sensitized person. Everyone has seen sunburn and knows that it tends to get well within a couple of weeks. But in my patient, without any further exposure and a month after the original exciting cause he began to relapse and a very severe exacerbation came on. This had the peculiarities that have been described. These peculiarities and this later outbreak have to be accounted for in some reasonable way. The picture was certainly one that must suggest pellagra and it suggests nothing else that is very probable. The subsequent history is again more consistent with a diagnosis of pellagra than anything else. My extracts from Wood's book show that a very long period of desquamation is one of the peculiar characteristics of pellagra. My patient had not finished desquamation in the middle of March, more than three months after the exposure to the sun, and two months after the relapse. This is not like the history of a common sunburn.

There is one other disease that has been suggested as a diagnosis, namely *lupus erythematosus*. The eruption in that disease is very symmetrical and it sometimes attacks the backs of the hands, but except in the rare disseminated variety the affection on the hands is of a very mild type. In my patient the eruption was far worse on the hands than on the face. *Lupus erythematosus* shows a tendency to affect the hairy scalp, not necessarily always, but at all events pellagra never does. In my patient the eruption avoided not only the scalp, but also the site of the moustache. In *lupus erythematosus disseminatus* the symptoms are severe and acute and in this form bullæ have been described as forming on the backs of the hands. According to Pusey this form of *lupus erythematosus* is excessively rare.[6] Sutton states that practically all the cases that have been reported have occurred in women.[7] Apparently also, the cases have been frequently, if not invariably, in patients dying of tuberculosis. My patient was a man and there was no evidence of tuberculosis.

Is it possible that some supposed cases of *lupus erythematosus* have been really undiagnosed pellagra? Pusey, in his 1000-page book on the principles and practice of dermatology, published in New York in 1907, states in reference to pellagra that "it is unknown in America." Yet it became known very soon that at the time he was writing there were thousands of cases of the disease in the United States. Dermatologists and others must have seen many of them. Failing a diagnosis of pellagra, they had practically only three others to choose from, namely sunburn, *lupus erythematosus* and *erythema multiforme*. What was the diagnosis entered in their case books before the disease was recognized as pellagra? Was it sometimes *lupus erythematosus?*

Post-scriptum, May 29, 1924.—I have seen the patient again today. There is active peeling on the backs of both hands with pigmentation of the area. The areas on the face (affected in January) are marked by a persisting dusky pigmentation, but the skin is not now rough. Note that it is now nearly five months since the severe attack and nearly six months since his exposure to the sun.

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Reports of Cases.

INTUSSUSCEPTION.

By E. MORRIS HUMPHERY, M.B., Ch.M.,
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K.J., female, aged seven months, was admitted to the Royal North Shore Hospital at 8.30 a.m. on April 10, 1924, with the following history:

The child had wakened her mother at 1 a.m. by screaming, she appeared very pale, but took a feed from the breast and vomited almost immediately. The vomiting and screaming continued at intervals right up to the time of admission to the hospital. An hour after the onset a normal motion was passed, in another hour the motions contained a few streaks of blood and an hour before admission a quantity of pure blood was passed.

The only previous illness was an attack of diarrhœa a week before from which the child had recovered.

On examination the child was pale and restless, but was not crying and did not appear to be in pain. Temperature was 37.2° C. (99° F.) and the pulse rate one hundred and eighty in the minute. A large firm oval tumour was readily palpable in the left upper portion of the abdomen. No attempt was made to reduce it by enema and immediate operation was decided upon. On opening the abdomen the intussusception was found to consist of the lower seventeen and a half or twenty centimetres (seven or eight inches) of the ileum which had invaginated with the caecum and whole of the ascending and transverse colon as far as the splenic flexture. By gentle squeezing the mass was gradually reduced and then it was seen that the region of the commencement of the intussusception was gangrenous. About fifteen centimetres (six inches) of the bowel, including the caecum and part of the ileum were therefore cut away after tying the vessels. The ends of the remaining bowel were turned in and sewn over and a lateral anastomosis made between ileum and colon as the child's condition seemed good enough to allow it being done and save a second operation later on.

For the first forty-eight hours the vomiting after food continued and there was a good deal of abdominal distension. This was relieved on two occasions by hypodermic injections of "Pituitrin" followed by enemeta. Once this was relieved, the recovery was uneventful.

Reviews.

PSYCHO-ANALYSTS ANALYSED.

IN "Psycho-Analysts Analysed" by Dr. P. McBride we find a comprehensive review of the position of psycho-analysts at the present day.[1] The author has retired from practice and has thus been at liberty to make a careful study of the literature of the exponents of psycho-analysis. He has come to the conclusion that psycho-analysis is unscientific and has not justified for itself any position in medicine, because it rests purely upon assumption and not upon facts. He says that in order to become a psycho-analyst it is necessary to assume certain things: (i.) An unconscious mind in the Freudian sense; (ii.) that all dreams are significant; (iii.) there exists a dynamic psyche.

Up till now the psycho-analysts have not, in Dr. McBride's opinion, supplied proof of any of these premisses, whereas neurology and physiology of the central nervous system are sufficient to afford a much more rational explanation of psychological processes.

The author is very just in his description of the main conceptions in the psycho-analytic theory and has been acknowledged as such by a supporter of psycho-analysis in a letter, subscribed L.G.R., to the *Empire Review*, 1923; so that the reader is not misled by an unfair description of the tenets that the author sets himself out to discredit. He contends amongst other objections that "unconscious mind" in the Freudian sense is a contradiction of terms, as the word mind implies consciousness. "Can anyone imagine anything having knowledge and yet not being conscious, especially when that anything is endowed with ideas, knowledge, ingenuity and imagination which make the plots of Conan Doyle and his creation Sherlock Holmes pale into nothingness? Yet this is what Freud's censor is supposed to be." In regard to the interpretation of dreams the author shows by comparing the principles of interpretation adopted by different leaders of the new psychology that "the significance of dreams" so strongly advocated by psycho-analysts in general has a different significance to each individual interpreter and therefore is a very unreliable and unscientific method of arriving at a conclusion. This book is a valuable contribution to the library of any student of psychology or psychiatry. It ably fulfils its purpose, but its value would be further enhanced by the inclusion of an index.

[1] "Psycho-Analysts Analysed," by P. McBride, M.D., F.R.C.P.E., F.R.S.E., with Introduction by Sir H. Bryon Donkin, M.D. (Oxon.), F.R.C.P.; 1924. London: William Heinemann (Medical Books), Limited; Crown 8vo., pp. vii. + 142. Price: 3s. 6d. net.

DIET IN HEALTH AND DISEASE.

WHEN a book has reached a third edition it is safe to say that it has fulfilled a public want. That would be true, even were its real merits small. In this case, the book "Nutrition and Clinical Dietetics" by Carter, Howe and Mason is one of real merit.[1]

The production of a good book on the subject of which it treats must be in these days, when knowledge has so much increased, a task of enormous difficulty and one hardly to be accomplished by one man. The three collaborators in this work show themselves to be well equipped and as we turn over the pages from chapter to chapter, we realize that they have taken an immense amount of trouble to make it a satisfactory and up-to-date guide to the medical practitioner. They acknowledge in their preface that they are conscious of the fact that dietetics is far from a mature science and that a book founded entirely on facts proved in the laboratory is as yet impossible. But, as they also remark, throughout the entire range of disease there must be a knowledge of the facts of the bio-chemistry of foods, combined with clinical experience and good judgement if the best results are to be expected. It is on these principles that the book is planned and carried out. It is divided into several sections, of which Part I., comprising the first one hundred and forty-seven pages, is devoted to normal nutrition and the physiology of food. The reader will find this a very clear and well-written exposition of the present views of physiologists on these matters. It shows an extensive knowledge of recent literature.

Part II. embodies within ninety pages a series of chapters on the various materials that are used as food. This also is done very well.

Part III. of about forty pages is devoted to the subject of feeding in infancy and childhood and Part IV. on feeding in disease, occupies the remainder of the book and covers something like four hundred pages. It is in this part that the "clinical experience and good judgement" have their chance. Naturally, this is a part of medicine in which empirical systems of treatment have had a very free field. The writers give systems careful and respectful, but not uncritical attention. Attention is given to the dieting of patients suffering from surgical conditions, pregnant women and so on. The last chapter in the book contains a number of tables showing chemical composition of foods, nutritive values of various small quantities of foods, caloric values and weight and measure comparisons.

The book is in understandable language, it is not padded and it is well printed. Moreover, its material is sound, useful and practical.

[1] "Nutrition and Clinical Dietetics," by Herbert S. Carter, M.A., M.D., Paul E. Howe, M.A., Ph.D. and Howard H. Mason, A.B., M.D.; Third Edition, Thoroughly Revised; 1923. Philadelphia and New York: Lea and Febiger; Demy 8vo., pp. 751. Price: $7.50 net.

The Medical Journal of Australia

SATURDAY, JUNE 21, 1924.

The Science and Art of Midwifery.

FOR several years this journal had criticized the medical curriculum of the three schools of medicine in Australia. The practice of medicine throughout the land depends primarily on the nature of the training given to the medical practitioners when they were students. We are constantly told that medicine and surgery have made colossal strides in recent times and that great discoveries have been the order of the day. If the average general practitioner has been unable to maintain the rate of progress determined by the fresh accessions to medical knowledge, the fault must be sought rather in the manner of teaching than in his aptitude for learning. The advocates for the retention of the old curriculum claim that the student at the present time is so overburdened with new subjects that it has become impossible for him to absorb all the information available. It would be unjust and futile to lay the charge of faulty training at the feet of the teachers, for they have to conform with the prescribed methods and with the details of the programme. In our opinion that system has outgrown its utility. It is possible for the average student to acquire within the space of five or six years a sound working knowledge of all those branches of medicine with which the general practitioner is concerned. The whole subject is too large to admit of general discussion in one short article. It is therefore advisable to attack one chapter at a time.

Every general practitioner is expected to safeguard the life of the parturient woman. His midwifery work is perhaps the most important of all his duties. Moreover it must be remembered that this work belongs to preventive medicine, for childbirth should be a physiological and not a pathological process. The excessive maternal morbidity and mortality and infantile mortality in every country in the world are evidence that this natural function is very frequently the precursor of disease and death. Not long ago Dr. Comyns Berkeley wrote eloquently on the abuse of forceps. He emphasized the deplorable fact that the damage inflicted on women and their infants by the unskilful or unjustified application of this instrument was due to the faulty training of students. The student is not taught how to apply forceps and has to experiment on his unfortunate patients after graduation. Again, the ridiculous regulations of his practical training are responsible for his inability to keep the mechanism of labour clearly in mind during the whole process. Dr. Comyns Berkeley draws a vivid picture of the inexperienced and inexpert young practitioner succumbing to the importunities of the relatives who fail to realize that premature, unnecessary or late application of forceps may be fraught with most serious consequences. The public is entirely ignorant in this regard. Even those who pass as well educated people, still hold to the mystic view that the chief dangers of childbirth are delay, "catching cold" and some inexplicable disturbance of the mammary function. As long as this crass ignorance continues, the medical practitioner's task at the bedside of his patient must remain unnecessarily difficult. And in the meanwhile there will be no general demand from the lay public for a reform in the obstetric training of medical students.

The first fundamental mistake in the present mode of teaching is that the theoretical teaching is divorced from the practical. The student should have his attention riveted to his subject. He should study the anatomy of the female organs of generation and all that is known concerning their functions. This should include an investigation into the bio-chemistry and bio-physics of the secretions of these organs. In direct association with this study, the physiology of pregnancy and parturition should be taught to him and carefully elucidated with the aid of the lower animals. Much waste of time could be avoided if this training were given in the form of demonstration and not by systematic lecture, for a skilful demonstrator can cover more ground in an hour than can a lecturer, he can make his teaching more individual and he can ascertain as he proceeds whether or not his

students have grasped all the essential points. Then the student should pass on to the obstetric ward or maternity hospital and witness normal labours conducted by expert practitioners. As he manifests proficiency he should be required to undertake the management of several labours under supervision. In the course of three months he would probably be present at several abnormal births, especially if the clinic were a large one. The next steps entails attendance at a well-equipped ante-natal clinic where he would learn the art of abdominal palpation, where he would become familiar with the signs of contracted pelves and other mechanical abnormalities, where he would be shown how to detect premonitory symptoms of eclampsia and the analogous conditions. He would learn many other things as well at this indispensable institution, all of which contribute so largely to the preventive aspect of midwifery. Lastly he would return to the lying-in ward where he would be given a reasonable amount of responsibility in the management of labour. The curriculum, if logically planned, would require the student then to take up the study of infant physiology, with special reference to infant feeding and care and to proceed with work on diseases of children.

If a course of this nature were inaugurated, it would be essential to have maternity hospitals and clinics of considerable magnitude recognized for the purposes of teaching. Similarly ante-natal clinics would have to be established and absorbed into the circle of recognized institutions. Both the hospitals and the clinics should be supported by State subsidy and be under the control of the director of obstetrics who would be responsible for the general arrangement of the training and for the conduct of the institutions from the professional point of view. The cost of upkeep would be considerable, but since these institutions would serve as a guarantee for the safety of mothers and their babies, it would represent a first class investment. The director should be a highly salaried expert. He should be denied the right of private practice, but might be allowed to act as consultant within a defined area, provided that this work would not interfere with his teaching or hospital or clinical practice. His staff should be adequate in size and comprise young graduates who had proved themselves competent to teach and to practise as experts.

It is scarcely necessary to state that if students were trained in this or a similar manner, they would go out into the world after graduation as competent obstetricians. Surely this would soon be reflected in a material lowering in maternal and infantile morbidity and mortality. Childbirth would become again a physiological process.

Current Comment.

DISSEMINATED SCLEROSIS.

Two different views are held as to the causation of disseminated sclerosis. According to one view disseminated sclerosis is a disease of infective origin and according to the other it is purely a degenerative process. Pierre Marie suggested that various infective fevers might give rise to disseminated sclerosis as a sequela. It has been pointed out, however, that the lesions produced and their mode of evolution are different from ordinary inflammatory foci following febrile illnesses and also from the lesions produced by *encephalitis lethargica*. Although much resemblance is seen between the lesions produced by disseminated sclerosis and those produced by cerebral syphilis there is no evidence that the former is syphilitic in nature. Much bacteriological observation has been undertaken in an effort to throw light on the subject. Siemerling demonstrated living spirochætes in the brain of a patient a few hours after death from disseminated sclerosis. Similar observations were made by Büscher and Speer. Kühn and Steiner found in the blood of four patients a delicate spirillum similar to that found in connexion with Weil's disease. They named this organism the *Spirochæte argentinensis*. In 1919 Marinesco recovered the spirochætes described by Kühn and Steiner from the brains of guinea pigs which had been injected with the serum of patients suffering from disseminated sclerosis. Kühn and Steiner also succeeded in infecting guinea pigs and rabbits by the injection of cerebro-spinal fluid of persons in the early stages of the disease. The morphological characters of the *Spirochæta argentinensis* has not been accurately determined and Purves-Stewart was undoubtedly right when he said that it was prudent to await further confirmatory evidence before accepting it as the true pathogenic organism of disseminated sclerosis.

Although it has been the tendency for a number of years for neurologists to regard disseminated sclerosis as a disease of infective origin, there are still some who do not hold this view. The subject

has been reviewed recently by Dr. C. P. Symonds.[1] He discusses the pathological anatomy and gives a good résumé of recent work along these lines. He refers to the work of Siemerling and Raecke in 1914. These observers concluded that in the earliest stages of the disease changes in and around the small vessels are found. These changes are not present in all foci nor when present are the changes evenly distributed. Dawson in 1916 published a series of histological observations on nine cases of the disease. He found that in all instances the foci of degeneration were frequently related to the distribution of the blood vessels in the brain, around the ventricles and in the spinal cord. The symmetry of the lesions on either side of the central longitudinal axis of the brain stem and spinal cord was most remarkable and was easily explained by the assumption that the virus of the disease is distributed through the blood vessels. Dr. Symonds points out that there is one important respect in which Dawson's observations and conclusions differ from those of Siemerling and Raeke. In no instance was he able to find any peri-vascular infiltration with lymphocytes or plasma cells. He considers that the earliest stage in the formation of a sclerotic focus is a sub-acute degeneration of the myelin sheaths. In response to the presence of the fatty products of degeneration numbers of mononuclear phagocytes are developed from the glial cells and the vascular endothelium. These take up the fatty droplets and become the fat granule cells. They make their way towards the small vessels and become grouped around them. Dawson thought that the possibility that areas at such a stage of development had been taken as illustrating cell-infiltrated areas might explain the great significance that has been ascribed to the vessels and to the inflammatory nature of the process. It is interesting to note that Oppenheim found the vessels within the foci considerably increased and a diffuse infiltration of cellular elements around them. The majority of these were true plasma cells and were regarded as indicative of an inflammatory process. Dudgeon and Birley, as stated by Dr. Symmonds, reported in a recent investigation that the most conspicuous feature in their sections was the well marked peri-vascular infiltration with round cells and endothelial cells, similar to that met with in cases of *encephalitis lethargica*, though not quite so intense. Dr. Symonds also refers at considerable length to the work of Hassin. Hassin concluded that the primary change was a degeneration of the myelin sheaths and that all subsequent reactive phenomena were purely secondary. He held that the histological picture was exactly comparable to that seen in secondary degeneration following, for example, a vascular lesion of the internal capsule. He said that it was an error to regard the cellular infiltration as an inflammatory reaction and maintained that such an error would become evident by the use of osmic acid or scarlet red stain. Hassin thus held that disseminated sclerosis is primarily a degenerative process. He maintained that there was a complete absence of inflammatory phenomena and that for this reason the causative agent could not be an organism. In reply to those who hold that the cellular infiltration is inflammatory in nature, he said that cases in which such phenomena were seen, were not disseminated sclerosis at all.

Dr. Symonds says that it is evident from recent work on the subject that any attempt to demonstrate the existence of true inflammatory, peri-vascular infiltration in disseminated sclerosis will be met by two objections. In the first place it will be said that the condition under consideration is not disseminated sclerosis at all and secondly the objection will be raised that the peri-vascular infiltration consists of fat-granule cells and not of lymphocytes and plasma cells. He reports an instance in which he believes that both these objections have been answered. The patient was a woman who died in an acute exacerbation of her illness two years after the first symptoms had been noticed. The history is typical of disseminated sclerosis and it is not necessary to describe it in any detail. Microscopical examination at autopsy revealed innumerable foci of degeneration scattered through the cerebro-spinal axis. The distribution of these foci was that commonly seen in disseminated sclerosis. They were seen in all stages from that of fatty degeneration to the dense gliosis of the true sclerotic patch. In the substance of the brain and brain stem the relation of each small focus to a central dilated venule was as a rule obvious. In the spinal cord this relationship could not be established. Two kinds of cell infiltration were distinguished. In the foci which were in a stage of fatty degeneration, clusters of small, darkly stained nuclei were seen around each vessel. When stained with osmic acid or Scharlach-R stain, these nuclei were seen to lie within globular cells laden with fat granules. In other areas of the brain stem "an occasional venule" was seen surrounded by a cuff of densely packed nuclei, apparently those of lymphocytes, with an occasional plasma cell. This type of infiltration is described by Dr. Symonds as indistinguishable from that commonly seen in *encephalitis lethargica*. Dr. Symonds states that his general impression is that, although this type of infiltration is not a constant feature of disseminated sclerosis, it does occur in the acute stages. He also points out that the type of cellular reaction is that met with in all diseases of the central nervous system known to be due to micro-organisms and from this he forms the conclusion that the cause of disseminated sclerosis is in all probability of a similar nature.

In discussing Dr. Symonds's work it must be remembered that it has been shown that whilst changes occur in connexion with the blood vessels in a certain proportion of instances, such changes are not constantly present. Risien Russell has said that some cases are normal in this respect. At the same time Dr. Symonds's findings are exceedingly interesting and worthy of the closest study. They indicate, moreover, particularly with the methods of staining which he has used, that disseminated sclerosis still offers a fruitful field for further investigation.

[1] *Brain*, Volume XLVII., Part I., 1924.

Abstracts from Current Medical Literature.

MORPHOLOGY.

The Origin of the Subclavian Artery.

CHARLES F. DE GARIS (*The Anatomical Record*, October 20, 1923) during routine observations in the dissecting room studied anomalies of the aortic arch and particularly of the subclavian artery and its components. The study was based on records of two hundred and seventy-eight dissections of white and mixed negro subjects. The author describes the origin of the subclavian artery as it is related to the origin of other aortic stems. An aortic arch of two stems was observed in two instances. The two stems consisted of the innominate artery and the left subclavian artery. According to Quain this is the most common variation of aortic stems in man and is normal in most apes. Two types of aortic arch of three stems were discovered. In one type there arose from the arch the right subclavian artery, a bicarotid artery dividing into right and left common carotid arteries and the left subclavian artery. This anomaly is regarded by Quain as rare and occurs as the normal condition in some cetaceæ. In the other type there arose in the normal manner the innominate artery, the left common carotid artery and the left subclavian artery. This conventional pattern was found in all but twelve instances. Three types of aortic arch of four stems were found. In one type, found in two instances, there arose the innominate artery dividing into right subclavian and common carotid arteries, the left common carotid artery, the left vertebral artery and the left subclavian. In the second type there arose the innominate artery, the *thyreoidea ima* artery, the left common carotid and the left subclavian artery. In the third type there arose the right common carotid, the left common carotid, the left subclavian and the right subclavian arteries. This third type of anomaly has been frequently reported. Quain described an anomalous right subclavian artery passing between the œsophagus and the trachea and Holzapfel found in the literature twenty instances of this condition as well as six in which the artery passed in front of the trachea. In the instance reported by the author the anomalous right subclavian differed from those previously reported in size and relationship to the cistern of the thoracic duct. The right subclavian artery arose from the deep aspect of the left extremity of the aortic arch opposite the third thoracic vertebra, it crossed the dorsal thoracic wall at an angle of 50° to a horizontal base line through its origin and passed between the vertebral column and œsophagus to reach the upper surface of the right first rib. Its complement of branches was deficient in that the right vertebral artery arose from the right common carotid. Among the instances of this type of anomaly recorded by Holzapfel some degree of dilatation in the first portion of the artery was present in 64%. No dilatation was present in the author's cases. On the contrary it was both relatively and absolutely small throughout. Its size suggested the type described by Geddes who explained it as being the result of a channel opened up by anastomosis between the aortic intercostal and superior intercostal arteries. The thoracic duct took its usual course, passing to the left subclavian vein between the anomalous right subclavian artery and the vertebral column. Just before passing beneath the anomalous artery it displayed a pronounced cistern measuring forty millimetres in length and eleven millimetres in breadth.

Meninges of Birds.

O. C. HANSEN-PRUSS (*Journal of Comparative Neurology*, December 15, 1923) states that the meninges of birds do not differ in essential structure from those of mammals. Previous investigators have hesitated to divide the lepto-meningeal tissues into arachnoid and *pia mater* on the ground that the meshwork between the two is too fine to justify the division, but Hansen-Pruss shows by injection of diluted India ink and of isotonic potassium ferro-cyanide and iron-ammonium citrate (afterwards precipitated) into living chickens and pigeons that true sub-arachnoid spaces exist. Such sub-arachnoid spaces are lined by flattened mesothelial cells and are filled with a true cerebro-spinal fluid some drops of which were obtained by puncture of the *cisterna magna* in the living animal. In the region of the *sinus rhomboidalis* which occurs at the level of the sacral enlargement, the avian meninges show a striking variation from the mammalian form. The posterior cords of the spinal medulla are here separated and form what appears on first sight to be a dilatation of the central canal to form a ventricle, but close examination reveals that the canal continues unaltered, being suspended in the sinus by the loose lepto-meningeal tissue which has invaded the medulla at this situation. Although the arachnoid is intact over this area, it is fused at the lips of the sinus with the *pia mater* and so the spaces in the sinus are isolated from the functional sub-arachnoid spaces. The reticular spaces so isolated are filled with a gelatinous colloid.

Blood Stream in the Labyrinth of the Ear of Dog and of Man.

GEORGE E. SHAMBAUGH (*American Journal of Anatomy*, September 15, 1923) finds that the arterial supply to the labyrinth of the dog and man comes through a single vessel which enters through the internal meatus. In the human ear the first branch of the labyrinthine artery is a substantial vessel which near the beginning of the basal coil of the cochlea separates into two divisions. One of these supplies the proximal end of the basal coil, anastomosing with the artery of the cochlea at about the junction of the middle with the distal third of the basal coil. The other division turns back across the vestibule and becomes the posterior vestibular artery. From this vessels are given off to supply the *macula acustica* of the saccule. One branch passes directly across the posterior aspect of the vestibula toward the *macula acustica* of the utricle. This vessel lies in the periosteum and does not supply the capillaries of the *macula acustica*. The posterior vestibular artery supplies the *crista acustica* of the posterior semi-circular canal, the posterior crus of this canal and of the horizontal canal as well as the *crus commune*. The labyrinthine artery after giving off this first branch continues but a short distance when it divides into two trunks, one becoming the artery of the cochlea, the other, following the *ramus articulus ampullaris*, constitutes the anterior vestibular artery. From the latter vessel branches are given off to supply the *macula acustica* of the utricle, the *crista acustica* of the superior and horizontal canals and the anterior cruræ of these canals. From this arrangement of the arterial tree of the labyrinth, it is apparent that disturbances of the circulation such as would be produced by emboli are capable of destroying the function of the several end organs as follows: An embolus lodging in the trunk of the labyrinthine artery would suppress the function of all the end organs, both in the cochlea as well as in the vestibule and semi-circular canals. This phenomenon has been repeatedly observed as the result of air emboli among caisson workers. An embolus lodging in the first branch of the labyrinthine artery would destroy the blood supply for the proximal two-thirds of the basal coil together with that of the *macula acustica* of the saccule and the *crista acustica* of the posterior canal. In the same way an embolus lodging in either of the two divisions of this vessel would suppress the function of the part of the basal coil supplied by it or the function of the *macula acustica* of the saccule and the crista of the posterior canal. Again, an embolus lodging in the labyrinthine artery after the first trunk has been given off would suppress the organ of Corti in all but the proximal two-thirds of the basal coil, the *macula acustica* of the utricle and the *crista acustica* of the superior and horizontal canals. An embolus lodging in one of the two divisions of this vessel would suppress the function of that part of Corti's organ described above or the function of the *macula acustica* of the utricle with that of the *crista acustica* of the horizontal and superior canals. In the venous system of the human labyrinth, two veins are always found

leaving the labyrinth, one at the *aquæductus vestibuli*, the other at the *aquæductus cochleæ*. The vein of the *aquæductus cochleæ* constitutes the main vessel draining the labyrinth. The author gives six plates with drawings illustrating the blood supply to the labyrinth in dog and man.

MORBID ANATOMY.

Sacculitis of the Jejunum.

A. PINNAGER AND C. E. L. BURMAN (*The British Journal of Surgery*, October, 1923) report an instance of sacculitis of the jejunum associated with acute intestinal obstruction due to embolus in an intestinal branch of the superior mesenteric artery in a man, sixty-seven years of age. About one hundred and twenty centimetres from the duodeno-jejunal junction the sacculated condition of the bowel was encountered and traced to the duodeno-jejunal junction, where the most definite sacculation was discovered. There was no sign of inflammation in any of the sacculi and all were empty. In a commentary, Professor C. S. F. Saint says that obstruction and a weak spot in the wall are usually associated with the development of sacculi in any of the hollow muscular systems. The obstruction is usually associated with a resultant increase in the intra-visceral tension. The weak places in the wall may be congenital or acquired. The congenital weaknesses are usually at situations where some structure pierces the wall, *exempli gratia* blood vessels or the ureter in the urinary bladder. The acquired weaknesses are usually the result of some destruction of the outer walls either by injury or inflammation. As opposed to sacculi, diverticula are of congenital origin; all the coats of the affected viscus enter into the composition of their wall; all have a special vascular supply of their own; they are seldom, if ever multiple and they are found at any age. To Rutherford Morison is attributed the opinion that sacculi are never of congenital origin, are associated with obstruction of the outlet and weakness of the wall of the affected viscus, are multiple, are thin walled because they are mostly hernias of the inner coat through the muscular coat and are liable to the same pathological processes as occur in the appendix and other diverticula.

Rhabdomyoma of the Uvula.

C. NICORY (*The British Journal of Surgery, October*, 1923) reports a case of rhabdomyoma of the uvula in a girl five years of age. Professor Shattock made the histological examination and found a highly cellular sarcomatous basis in which were distributed groups of large sarcoblasts, round or polygonal in form, and many with more than a single nucleus. The growth recurred as a small nodule in the soft palate at the base of the excised uvula and seven months later had invaded the greater part of the right side of the soft palate. The literature on rhabdomyoma is reviewed by the author who concluded that true rhabdomyomata, especially in early life, are probably the result of the inclusion of sarcoblasts in unusual positions. In certain instances an injury to a normal striated muscle may set up a process of embryonic proliferation and lead to the formation of a rapidly-growing muscular tumour.

Neoplasms of the Testis.

A. H. SOUTHAM AND E. A. LINELL (*The British Journal of Surgery*, October, 1923) say that malignant disease of the testis is comparatively rare and occurs about once in one thousand five hundred surgical male admissions to hospital. In forty-five collected instances seven occurred in the imperfectly descended testis. The commonest malignant tumour of the testis arises in germinal epithelium and is usefully and accurately described as a spermato-cytoma. Sarcoma is an extremely rare tumour of the testis, most of the growths so called being definitely epithelial in type and more correctly classified with the spermato-cytomata. True carcinoma of a spheroidal-celled form is frequently found in the testis. It probably arises from a malignant metaplasia of the epiblastic or hypoblastic cell-elements of a teratoma. Teratoma although histologically innocent, may form metastases and is extremely liable to malignant change.

The Histology of Acute Encephalitis.

C. DA FANO (*The Journal of Pathology and Bacteriology*, January, 1924) describes in detail the histology of the central nervous system as observed in an acute case of encephalitis presumably of the epidemic type. The chief interest lay in the very acute clinical course and in the variety of the histopathological lesions. The presence of a certain number of small round hæmorrhages in the white matter of the cerebral cortex and the *post mortem* findings in the respiratory organs gave rise for a moment to the suspicion that the condition might be one of so-called influenzal encephalitis, but the clinical and histo-pathological features were against this assumption. Small round hæmorrhages were not so numerous as to justify the use of the expression "*purpura cerebri*," which in the recent opinion of von Monakow would represent the most typical lesion of encephalitis from influenza. On the other hand it should not be forgotten that bronchial and pulmonary lesions have been repeatedly observed in cases of lethargic encephalitis and that probably the encephalitis virus has its habitat in the upper respiratory passages from where it may in certain conditions reach the central nervous system. It is perhaps for this reason that some authors, like Mittasch, consider both epidemic and acute hæmorrhagic encephalitis as somewhat different forms of influenza. But little evidence has been brought forward in favour of this suggestion. Against it might be mentioned the great uncertainty that surrounds the ætiological problem of influenza. In the present instance death supervened with such rapidity that polymorphonuclear leucocytes which in the opinion of various authors play a principal part in the initial stages of all inflammatory processes of the central nervous system, could still be seen in extraordinary numbers in the material investigated. Within the polymorphonuclear leucocytes "minute bodies" were seen identical with those described by the author in previous papers. A certain, though not undue, importance should be attributed to the presence of these "minute bodies," even if nothing definite can so far be said as to their precise nature. The author concludes that the case he describes was probably a somewhat atypical one of lethargic encephalitis.

Lipoid Staining.

J. LORRAIN SMITH AND THEODORE RETTIC (*Journal of Pathology and Bacteriology*, January, 1924) describe an aldehyde mordant for fats and lipoids. It is prepared by heating paraldehyde with dilute hydrochloric acid at a temperature of 37° C. By this method the paraldehyde is changed to aldehyde which then undergoes aldol condensation. In a flat-bottomed flask of four hundred cubic centimetre capacity twenty-five cubic centimetres of paraldehyde are placed; to this are added twenty-five cubic centimetres of dilute hydrochloric acid. The flask is heated in an oven or incubator at 37° C. and is frequently shaken till the paraldehyde is dissolved; this will take fifteen hours or longer. The solution should then be light brown in colour. The pale brown solution is diluted with water, neutralized with caustic soda, made up to a litre (2.5% of the original strength of the paraldehyde). The reaction is adjusted to pH of about six with acetic acid. This solution stored in brown glass bottles will keep for months. Should it become too acid, the reaction can be again adjusted to pH 6 with caustic soda. Tissues fixed in 10% formalin twenty-four to forty-eight hours are cut in frozen sections. If the tissue be exposed too long to formalin, the sections may fail to become stained. The sections are mordanted in small bottles with tight-fitting corks in the incubator at 37° C. for twenty-eight to forty-eight hours. A longer time may be needed for some fats. The section, after mordanting, is washed in water and stained six to eighteen hours in 1% hæmatoxylin in 0.5% acetic acid. It is differentiated with a solution of borax 1%, potassium ferricyanide 0.5%. The colour is discharged from the ordinary tissue, but the fat and lipoid globules remain dark blue. The method can be generally applied.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Walter and Eliza Hall Institute of Research in Pathology and Medicine on May 7, 1924, DR. J. W. DUNBAR HOOPER, the PRESIDENT, in the chair.

Radium Therapy.

DR. C. E. DENNIS O.B.E., read a paper entitled "Notes and Experiences in Radium Therapeutics" (see page 607).

DR. H. FLECKER read a paper entitled "Radium Emanation" (see page 610).

DR. R. R. WETTENHALL read a paper entitled "Radium Therapy" (see page 612).

DR. HERMAN LAWRENCE in opening the discussion said that he had listened with great interest and benefit to the remarks of the previous speakers who had so ably and enthusiastically dealt with the subject of radium therapy. They had considered it in such detail that it was quite impossible for him, in the time at his disposal, to discuss more than a few of the points brought forward.

There was no doubt that a radium institute which would supply radium emanation in suitable applicators, would be of the greatest value to medical men in Victoria for the treatment of malignant and other diseases. In the Section of Dermatology at the recent Congress, he had proposed that it was highly desirable that radium institutes should be established in Australia. The motion had been supported by Dr. E. H. Molesworth, Sydney, and passed by the members of the Section, but unfortunately the matter had not been brought forward at the final meeting of Congress.

Dr. Flecker had tabulated the advantages offered by radium emanation for therapeutic use and had emphasized that should an applicator containing radium emanation be lost, no monetary loss was involved. The rapid deterioration of emanation, however, was a great disadvantage in carrying out radium therapy by its means. The loss in radio-activity was as much as 16% in the first twenty-four hours and in three days the strength of emanation was reduced by approximately one-half. On the other hand, the strength of the radiation from applicators containing radium substances was constant.

He had been called upon at times to treat patients at a distance and it had frequently happened that twenty-four hours elapsed between the dispatch of the applicators and their arrival at their destination. It might be necessary to apply radium for twenty-four hours and modify the filtration before resuming irradiation. Such measures were quite practicable when the applicators contained radium, as the radiations remained constant, but with emanation the decline in potency introduced serious difficulties.

In a presidential address upon radium therapy, read at the Session of the Australasian Medical Congress held in Sydney in 1911, he had discussed a number of skin diseases and malignant conditions in which he had found radium therapy of great value. Since that date treatment by radium had made great strides and its usefulness was recognized in all branches of medicine, but especially in surgery, gynæcology, ophthalmology and laryngology. For just upon twenty years he had had the pleasure of supplying radium applicators suitably prepared for the use of members of the medical profession and he had always found medical men very willing to accept suggestions regarding the suitability of the pathological state and the method of treatment to be adopted.

Continuing, Dr. Lawrence said that radium therapy to be successful depended *inter alia* upon the radium therapist having a good practical knowledge of the radio-sensitivity of the various normal and pathological tissues. The reaction in tissues which had been exposed to radium radiations, whether including the emission of particles or otherwise, was probably of a chemical nature; the nuclei of the cells were particularly affected, mitosis did not occur and reproduction was thus prevented.

Among pathological tissues, lympho-sarcoma and some forms of sarcoma, especially those occurring in the tonsillar region, were particularly radio-sensitive. So also were the tumours of *mycosis fungoides*. Unfortunately in *mycosis fungoides*, relapses of the disease occurred and with each recurrence the tumours became less radio-sensitive, the patients finally succumbing to the disease. From his experience of *mycosis fungoides*, which dated back prior to the discovery of X-rays and radium, Dr. Lawrence stated that he considered irradiation was capable of prolonging life in some cases from six to eight years and that during this time the patient lived in comparative comfort.

As the previous speakers had spoken so fully upon the success attending radium therapy in uterine cancer, he would content himself with mentioning that he had found treatment by radium of the greatest value in carcinoma of the cervix and other malignant conditions.

Dr. Dennis and Dr. Wettenhall had both mentioned the success they had experienced in the treatment of nævi by radium. Some nævi were particularly radio-sensitive, notably the angiomata. With reference to the treatment of nævi he wished to state that he had found that the radio-sensitivity of nævi was greatest at birth and that the sooner radium treatment was initiated after birth, the better would be the result obtained.

Dr. Lawrence showed an illustration from his book on radium therapy, a photograph of a baby with an enormous angioma of the face. The condition was shown as it appeared before and during treatment by radium. He had exhibited this patient, now fourteen years of age, at the session of Congress held in Melbourne in November last and it was difficult to believe that the child had been born with the unsightly blemish shown in the photograph.

Another point which he had learned in connexion with the treatment of nævi by radium, was that it was a good thing, so to speak, to under-treat these babies and young children; with the growth of the child there was a great tendency for nævi which had received a certain measure of treatment, to improve without further irradiation.

Dr. Wettenhall had referred to the treatment of keratoses and rodent ulcers. In regard to keratoses and basal-celled epitheliomata (rodent ulcers), Dr. Lawrence said that since his return from America in 1908 he had treated six hundred and twenty-five patients for keratoses, sixty-five for keratoses and rodent ulcers and nine hundred and sixty-five for rodent ulcers. These figures were indicative of the great prevalence of these diseases in Australia and he had found radium an invaluable asset in their treatment.

Professor Hanzen, of Washington, in his book upon skin cancer stated that Hyde in America and he (Dr. Lawrence) in Australia had independently drawn attention to the actinic rays of the sun as taking part in the causation of cancer of the skin. In his paper on this subject, read at Rome in 1912, he had exhibited a map of Australia, kindly prepared by Mr. Hunt, Commonwealth Meteorologist. The map showed the low state of humidity of the atmosphere in Australia eighty kilometres (fifty miles) from the coast line and he suggested that this atmospheric state favoured the actinic rays in their harmful effect upon the skin. People of fair complexion were particularly susceptible to these influences.

Dr. Lawrence then referred to a paper he read on the subject of radium therapy before the Victorian Branch of the British Medical Association just twelve months ago. The paper embraced some results obtained in some experiments designed to study the effect of radium irradiation upon the metamorphosis of insect life. These results included death, retardation of growth, prolongation of life of larvæ as larvæ, determination of sex, sterilization and artificial parthenogenesis (reproduction without the male). In the discussion on the paper some uncertainty had been expressed regarding the parthenogenesis being due to the radium, as in the life history of the insect used for the experiments, *Bombyx mori*, parthenogenesis was known to occur. Likewise the "jelly-fish" embryonic stage of the Demodex was not accepted. In justice to himself he wished to state that he had since had letters from high authorities on these subjects and they had accepted both the demonstration of radium parthenogenesis and the embryonic stage of the Demodex.

Dr. Lawrence said that since reading the paper to which he had referred, he had carried out further experiments and had obtained a result which he had named for the present "Anthropogenesis", or reproduction without the female. Such a result at first sight might appear impossible, but he had been led to it in the following manner. In studying Rutherford's theory of the structure of the atom, *videlicet* a nucleus of positive units of electricity (++), with a planetary system of electrons—negative units of electricity—he had looked upon the nucleus (+) as macrogamete (ovum) female, and the negative (—) planetary system of electrons as microgamete (spermatozoids), males. In his experiment (radium parthenogenesis) he had bombarded the ova and incidentally the germ nucleus with a continuous stream of electrons from radium, thus stimulating the germ nucleus of the ovum as would a spermatozoon and embryonic development had followed. In later experiments (176 and 178), "Anthropogenesis," the germ nucleus of the ovum was rendered functionless. The four-weeks old larvæ were so irradiated that when they became moths the gonad tissues were affected in such a manner that when the moth, male or female, was mated with a normal control moth, female or male as required, the eggs were found to have been sterilized.

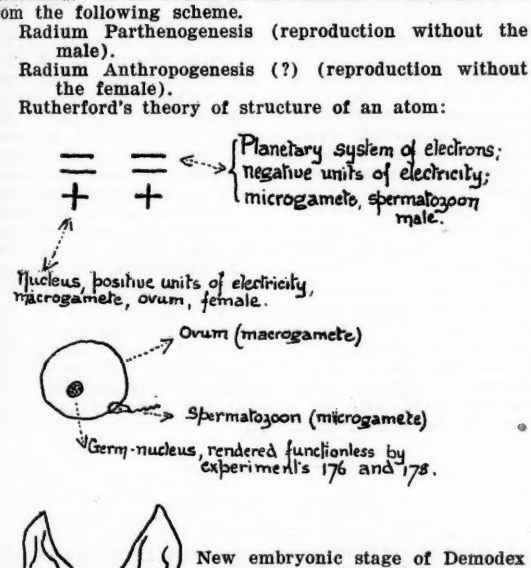
In the next place a female moth thus sterilized was mated with a normal control male moth and during the process a positive ionization of the ova was maintained by keeping the mating moths upon an applicator from a high frequency apparatus and encouraging ultra-violet rays to pass into and through them. He supposed that the positive ionization so affected the microgamete that it entered the ovum and was stimulated as by the presence of a normal germ nucleus. It probably absorbed nutriment from the protoplasm and itself took on embryonic development. The eggs in this experiment all went through the colour changes of fertilization and were apparently fertilized.

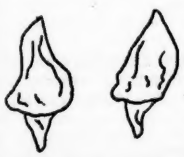
Dr. Lawrence explained that he advanced the term "Anthropogenesis" which he had coined, with some reserve as he felt that further confirmatory experiments must be performed. In the course of his remarks he demonstrated from the following scheme.

Radium Parthenogenesis (reproduction without the male).

Radium Anthropogenesis (?) (reproduction without the female).

Rutherford's theory of structure of an atom:


Planetary system of electrons; negative units of electricity; microgamete, spermatozoon male.
Nucleus, positive units of electricity, macrogamete, ovum, female.
Ovum (macrogamete)
Spermatozoon (microgamete)
Germ-nucleus, rendered functionless by experiments 176 and 178.



New embryonic stage of Demodex (accepted by Hirst [British Museum]).

This jelly-fish like organism is generally found in scrapings from the skin of patients affected with Demodex impetigo.

MR. J. S. ROGERS, of the School of Natural Philosophy, Melbourne University, said that in the consideration of establishing an institute of radiology it was to be remembered that the production of tubes of radium emanation required the services of a skilled glass blower and further that supplies of liquid air must be available to assist in the purification of the emanation. He indicated briefly the procedure necessary to obtain emanation tubes. A solution of radium chloride was introduced into a suitable vessel and the emanation collected in the space above the solution. Emanation, together with air and traces of electrolytic gases was then pumped out by means of a Töpler pump, the gases passing over phosphorus pentoxide to remove any water vapour. The mixed gases which included radium emanation, helium, hydrogen, oxygen and carbon dioxide, were then introduced into a vessel and exploded to remove any traces of oxygen; they were next brought into contact with caustic potash for the purpose of abstracting the carbon dioxide. The remaining gases were collected in a U-tube immersed in liquid air, the emanation condensed and the helium and hydrogen could be pumped off. The emanation was allowed to vaporize and was compressed by means of a mercury pump into the emanation tube which was finally sealed.

The difficulties associated with the purification of radium emanation became apparent when it was recognized that the volume of one curie of pure radium emanation was 0.63 cubic millimetre.

Mr. Rogers said that he had concluded from the method of application of the sources and the screening employed, that for radio-therapy the effective rays were the β rays and the softer γ rays. The softer γ would be effective by the ejection of electrons or secondary β particles from the atoms of the tissues under treatment.

Dr. Flecker had mentioned the possibility of using radium active deposit for therapeutic purposes and although intense sources could be thus obtained, it was to be remembered that radium active deposit when separated from the parent emanation decayed very quickly. At the end of one hour the activity of the source was roughly 50% of the original, and at the end of two hours it was only 14%.

In the case of radium emanation the half value period was three to eight days, so that at the end of a week there was still more than 25% of the original activity of the tube remaining.

From the point of view of the Natural Philosophy Department of the University it was to be hoped that an institute on the lines suggested would be quickly established, for sources of radium emanation and of radium active deposit were invaluable for research. He had been privileged to see the wonderful work which had already been accomplished with such sources by Sir Ernest Rutherford and his pupils in the Cavendish Laboratory, at Cambridge, and such sources were still extensively used.

DR. R. H. MORRISON said that he had followed the papers with much interest and that he wished to ask for an expression of opinion from the radiologists regarding the value of pre-operative and post-operative irradiation. As a gynæcologist his principal interest in radio-therapy concerned its application to carcinoma of the cervix. In dealing with this condition it had been his exprience that irradiation as a preliminary to operation was of value not as affecting the growth itself, but as having a very beneficial effect on the fœtid septic process which frequently supervened. Various authorities, however, had criticized adversely the practice of radio-therapy as a preliminary to operation in carcinoma of the cervix. All seemed agreed on the value of post-operative irradiation, but difference of opinion existed regarding the number of applications of radium advisable. Not long ago it had been the routine practice to apply radium to the area of operation immediately after the pan-hysterectomy and to give a second and even a third irradiation at intervals of three days and six months respectively. At the present time they found Graves, of Chicago, advocating one post-operative irradiation only and stating that the second was not only useless, but hazardous. Clarke, of Philadelphia, held the same views.

He felt that it would be helpful if a definite statement could be made with reference to the number of post-operative applications of radium necessary. He had fre-

quently been impressed with the value of radium and of deep X-ray therapy in the treatment of carcinoma of the cervix in the advanced stage in which operative measures were impracticable.

Dr. Morrison referred to the case of a woman who while travelling to Melbourne from Western Australia had been prostrated on the journey by a very severe uterine hæmorrhage. The existence of carcinoma of the cervix had been established by pathological examination of a piece of tissue excised for the purpose and he had considered that the patient was beyond any hope of cure by operation. Radium therapy had been instituted and although it was four years ago since he first saw the patient, then in an apparently hopeless condition, no trace of malignant disease could be detected by clinical examination. This patient was in good health; locally the vaginal walls were smooth and clean and there appeared to be nothing the matter.

Dr. Morrison outlined briefly the case histories of several other patients who had been similarly relieved by radium therapy after the malignant disease in the cervix had reached an inoperable stage.

DR. C. E. DENNIS in reply said that it had been constantly observed that pre-operative irradiation in the treatment of carcinoma of the cervix led to disappearance of fœtid discharge and general amelioration of the secondary septic process. Further the patients gained in health and weight and seemed to experience a general tonic effect from the irradiation. As a result they became better subjects for operation. He had made this point some years previously and had also noted the improvement in general health following irradiation in carrying out radio-therapy for tuberculous adenitis.

His inclination was to give one dose only after operation; it was desirable to avoid any more exposure of the tissues to radium than was necessary and he thought one irradiation should be sufficient. It was difficult for the radiologist to estimate the part played by radium in the prevention of recurrence of malignant disease after operation for carcinoma of the cervix; this was a point on which surgeons of experience should be able to speak.

It had often been stated that there was a danger of stimulating growth in malignant cells by the use of X-rays and radium. He could not recollect a single instance of such baneful consequences and his experience in radio-therapy extended back to the days when doses were employed which at the present day were considered quite small and inadequate. Those who saw a danger, apparently drew an analogy from the action of certain poisonous drugs which were tonic in small quantities and lethal in larger amounts.

Eminent radio-therapists and X-ray authorities had denied that malignant neoplasms were ever stimulated by irradiation and he hoped that the bugbear was laid.

DR. H. FLECKER urged that the meeting ought to take some action in initiating a movement with the object of securing for Victoria a well-equipped radium institute and physical laboratory. The principal activities of such laboratory would be continuous research in radium therapy and the collection and distribution of supplies of radium emanation.

DR. R. R. WETTENHALL supported Dr. Flecker. He pointed out that Victoria was already behind the times in this important matter and moved:

> That the Council of the Branch take such steps as are necessary to promote the establishment of an Institute of Radio-Therapy in Victoria.

The motion, seconded by DR. H. FLECKER, was carried unanimously.

PRESENTATION TO DR. A. L. KENNY.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Walter and Eliza Hall Institute on May 7, 1924, DR. J. W. DUNBAR HOOPER, the PRESIDENT, in the chair.

Presentation to Dr. A. L. Kenny.

A presentation was made to Dr. A. L. Kenny in recognition of his magnificent organizing effort as Honorary Secretary of the First Session of the Australasian Medical Congress (British Medical Association).

The PRESIDENT of the Branch invited MR. G. A. SYME, as President of Congress, to make the presentation.

MR. SYME said that members generally were aware that during Congress week in November last a large number of those attending Congress expressed a wish to put into permanent form their appreciation of the notable services rendered by Dr. Kenny in the organization of the Congress. The work entailed in giving effect to this widely expressed wish had been carried out by Drs. W. Kent Hughes, J. E. Nihill and Margaret McLorinan.

At the final meeting of the combined sections of Congress it had been his honour and privilege to ask Dr. Kenny to accept, on behalf of Mrs. Kenny, a pendant subscribed for by the Victorian members of Congress. The full amount, however, was not then expended and subscriptions continued to be received. Dr. Kenny was therefore requested to select some memento for himself and he had chosen the Persian rugs which it was now his very pleasant duty to present formally to him. He asked Dr. Kenny to regard the gift as an expression of the very high esteem in which they held him and particularly as a tribute to his self-sacrificing and extremely able efforts to which the signal success of the Congress was largely due.

DR. J. W. DUNBAR HOOPER said that as President of the Victorian Branch he wished to endorse every word spoken by Mr. Syme. As a Branch they should be very proud of the Congress and its Honorary Secretary, Dr. Kenny. He had received apologies for inability to attend from Sir James Barrett and Dr. Stanley Argyle.

DR. A. L. KENNY said that he found difficulty in expressing his thanks for the gift and his appreciation of the kindly feeling which prompted it. At the time he was made the recipient of the very handsome present for Mrs. Kenny, he had been taken quite unawares and he was afraid that on that occasion he omitted what ought to have been his first duty. However, he hoped to discharge it now by giving expression to his deep sense of the loyal cooperation of all concerned in the organization of Congress.

It was not possible for an individual to make a success of a Congress. He believed that the first session of Congress as now constituted had been brought to a successful issue and the happy consummation was due mainly to the enthusiastic and concerted efforts of all the individual officers. He was sure that the result achieved would not have been attained without the very great advantage accruing to the organization from the brain capacity, prudence, wise judgement and ability to deal with any and every emergency of the President, Mr. Syme.

Another main factor was the splendid work of the Secretaries of Sections. An innovation in the organization was the Committee of Secretaries of Sections and as the work progressed he was more and more impressed with the invaluable services rendered by that body. He was of opinion that the Committee of Secretaries of Sections should remain as a unit in the organization of Congress.

The whole period had been a very happy time for him chiefly by reason of the assurances he received day by day that he was earning the goodwill and appreciation of his fellow members of the medical profession. He asked them to believe that he was profoundly grateful for their tangible recognition of his services and thanked them from the bottom of his heart.

MEDICO-POLITICAL.

A MEETING OF THE "SOUTH-WESTERN DIVISION" OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Warrnambool on May 3, 1924, DR. H. I. HOLMES, the PRESIDENT, in the chair.

Country Laboratories.

Letters were received from the Director-General of Health for the Commonwealth stating that the request for the establishment of laboratories at Hamilton and Warrnambool by the Commonwealth Department of Health

would be considered. The establishment of such laboratories was in accord with the policy of the Department, but it was necessary that the laboratories should be distributed in different parts of the Commonwealth where they would be most useful.

Letters were also received from the Committees of the Hamilton and Warrnambool Hospitals, expressing their willingness to provide rooms for these laboratories.

It was decided to send copies of the letters to the State Minister for Health asking that the matter of subsidizing these laboratories, if established, be given consideration in connexion with the Estimates for the next year.

National Insurance.

After members had dined together the evening session was held at the Warrnambool Hospital. DR. J. NEWMAN MORRIS gave an interesting and informative address on the subject of national insurance with special reference to the working of the *National Insurance Act* of Great Britain. Many questions were asked and all aspects of the subject were discussed. Finally it was resolved:

> That the "South-Western Division" of the Victorian Branch of the British Medical Association is opposed to the introduction of national insurance on the lines of the British *Act* as in their opinion the necessity for such a measure does not exist in Australia, but consider that better facilities for the investigation of disease should be provided.

Next Meeting.

It was decided to hold the next meeting at Camperdown in September and to make it the occasion of a post-graduate lecture.

Correspondence.

COOPERATION OF MEDICAL PRACTITIONERS AND DENTISTS.

SIR: I read Mr. Wilson's letter in the journal of June 7, 1924, with interest and as a contribution towards cooperation suggest the following points as worthy of consideration by both dentist and general practitioner.

A tooth is practically specially modified bone, implanted in bone; if its "nerve" (or marrow) is removed it is a dead tooth and becomes a foreign body, powerless to feel pain (the common warning of active disease), but not powerless to cause trouble. Any tooth that has been treated by the dentist for caries, has been diseased and by a disease of whose causation we know very little, but which is certainly liable to relapse. The most we can hope is the preservation of a useful tooth for many years and that we certainly often see. But a dead tooth should not be preserved save under strict observation and at patient's risk and it should certainly never be crowned.

Clinically we see or rather recognize more trouble from crowned teeth than from any others. I am inclined to think that the necessary deep drilling *et cetera* often leads to local infection, even of the bone itself, during the operation or soon after. Any surgeon knows how practically impossible it is to insure absolute asepsis in the mouth, besides the fact that the tooth is a specially diseased one or it would not be crowned. I also think that infection is often a matter of luck—it may be blood-borne, perhaps years after, or perhaps be an infection spreading in from a gingivitis or a direct local infection at or before time of treatment. I do not regard the tooth as so much the trouble, as the fact of it being a foreign body in bone, leading directly or indirectly to infection of bone and acting as a most effectual plug to the discharges of the diseased bone. We all know the liability in bone infections to pyæmia, toxæmia *et cetera*. One often sees cases where the removal of a single tooth or two teeth or three teeth *et cetera* will clear up symptoms, sometimes extraction of one tooth abolishes certain symptoms and of another other symptoms. I certainly think wholesale extraction of sound teeth a pity; but in certain serious clinical conditions, such as recurrent arthritis, severe neuroses or threatened psychoses I would have no scruple in sacrificing every tooth that had ever been carious.

It has been interesting to compare practice in a remote country district where diseased teeth were either extracted or left alone, with that in a country town, where crowns, devitalization *et cetera* are universal. One sees in the latter ailments hardly ever seen in the former and on my first changing to a town practice I was at a loss for a diagnosis as to the cause, but arrived by a process of exclusion at the cause being dental disease, causing toxæmia *et cetera*.

I find great and undue weariness, palpitation and tinnitus, "nerviness," low blood pressure, a trace of albumin *et cetera* very common, as also an affection of one or more joints and I have seen severe neuroses and one definite psychosis clear up, the former after two or three extractions and the latter after universal extraction. I am satisfied that a great deal of ill-health, often of indefinite type, may be due to toxæmia caused by a single tooth or two or three or more teeth and that the recognition of this fact would save a great deal of illness. The recovery, after drainage is secured by removal of the tooth, is sometimes dramatic, especially where the cause has been recognized early in the disease.

I have as yet no definite opinions on the treatment of pyorrhœa, but I have seen great improvement in the general clinical condition follow conservative dental treatment by a dentist. Just as the clinical course of an illness (as judged by the general practitioner in many cases) is the final test of an operation in surgery, so it must be in dentistry. The specialist may not see the wood for the trees. As surgeons abandon operations after judgement by clinicians, so may dentists do the same.

Finally, I regard "crowns" and the devitalizing and filling of teeth which have had an acute infection, as quite indefensible. The devitalization of any tooth is dubious (many dentists refuse to do these) and I think that one should never forget that a carious tooth is diseased and a filling does not necessarily stop the disease.

Yours, etc.,

MARY C. DEGARIS, M.D., B.S. (Melb.).

Gable House, 268, Latrobe Terrace, Geelong,
June 7, 1924.

"THE INSIDIOUS APPENDIX."

SIR: The following case may be of interest as laying emphasis on some points of Dr. Rutherford Darling's article in THE MEDICAL JOURNAL OF AUSTRALIA of the 19th *ultimo*.

At 11.30 a.m. on seventh instant I was called to see a patient, R.T., aged twenty years, on account of abdominal pain and vomiting.

He gave a history of an attack similar to the present two years ago, when he had fairly severe abdominal pain and vomiting recurring at intervals for two days. His medical attendant diagnosed acute appendicitis, but the patient recovered without operation.

When I saw him, he was lying on his back with his knees drawn up and looking slightly toxic. His tongue was moist but furred, temperature 99.4° F. and pulse eighty-four.

His first symptom had been sharp epigastric pain about 10 p.m. on May 5, followed by vomiting. He had had intermittent pain not very severe ever since, gradually working round to the right iliac region. He had vomited bile-stained material several times on May 6 and again after taking a light breakfast about three hours before I saw him on May 7. He had been constipated and to my regret had taken two "Indian Root" pills that morning.

On examination his abdomen moved almost normally, nor was there any marked tenderness, the most sensitive point being three centimetres above the right anterior superior iliac spine. No lumbar tenderness was detected.

There was no real rigidity, but a resistance just lateral to McBurney's point. He declined immediate operation, preferring to wait a few hours under observation.

I saw him again at 3.30 p.m.. He had had no more vomiting and his subjective symptoms were milder, but he was lying in the same position and looked more toxic; his temperature was 101.4° and his pulse one hundred and four. There was no increase of tenderness or rigidity. He was still unwilling for operation, as he "felt pretty comfortable," so I called in Dr. A. Allan to lend weight to my opinion.

At operation I found a long retro-caecal appendix (intraperitoneal), with a dense, matted mesentery. The distal three-quarters of the appendix was thicker than an average little finger and gangrenous; at the beginning of the gangrenous part was a large perforation and out of this, as I removed the appendix, fell a concretion measuring eighteen by twelve by eight millimetres.

That innocent seeming delay almost cost a life and its result speaks with eloquence of how cunningly the appendix can betray.

Yours, etc.,
E. P. DARK, M.C., M.B., Ch.M. (Sydney).

Katoomba, New South Wales,
Undated.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE following have been registered, under the provisions of the *Medical Act, 1915*, as duly qualified medical practitioners:

LAZARUS, ARTHUR MORITZ, M.B., B.S., 1924 (Univ. Melbourne), 26, Shakespeare Grove, Hawthorn.

OLDFIELD, GEORGE HERBERT, M.B., B.S., 1924 (Univ. Melbourne), Alfred Hospital, Prahran.

O'NEILL, SYDNEY, M.B., B.S., 1917 (Univ. Adelaide), F.R.C.S., 1922 (Irel.), corner Loch Street and Riversdale Road, Auburn.

PARKER, DOROTHEA LAURA HILL, M.B., B.S., 1924 (Univ. Melbourne), Queen Victoria Hospital, Little Lonsdale Street, Melbourne.

PARKER, NORMAN JAMES, M.B., B.S., 1924 (Univ. Melbourne), "Belleville," Dunolly.

Additional Diploma Registered.

JAMES, GWILYM TALIESIN, M.D., 1922 (Univ. Melbourne).

Names of Deceased Practitioners Removed from the Register.

EMBLEY, EDWARD HENRY.
JAKINS, WILLIAM VOSPER.

Medical Appointments.

THE undermentioned have been appointed Government Medical Officers in Queensland: DR. C. J. TAYLOR, at Thargomindah; DR. LAURA WEIR, at Cooktown.

* * * *

THE undermentioned have been appointed Government Medical Officers in New South Wales: DR. H. F. ALSOP (B.M.A.), at Mittagong; DR. G. P. ARNOLD (B.M.A.), at Windsor.

Medical Appointments Vacant, etc..

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi..

HOME AND TERRITORIES DEPARTMENT: Medical Officer for Papua.

ST. GEORGE DISTRICT HOSPITAL, KOGARAH, N.S.W.: Senior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

JUNE 24.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
JUNE 26.—New South Wales Branch, B.M.A.: Branch.
JUNE 26.—South Australian Branch, B.M.A.: Annual Meeting.
JUNE 27.—Queensland Branch, B.M.A.: Council.
JULY 1.—New South Wales Branch, B.M.A.: Council (Quarterly).
JULY 2.—Victorian Branch, B.M.A.: Branch.
JULY 4.—Queensland Branch, B.M.A.: Branch.
JULY 8.—New South Wales Branch, B.M.A.: Ethics Committee.
JULY 9.—Tasmanian Branch, B.M.A.: Branch.
JULY 9.—Melbourne Pædiatric Society.
JULY 9.—Central Northern Medical Association, New South Wales.
JULY 10.—New South Wales Branch, B.M.A.: Clinical Meeting.
JULY 10.—Brisbane Hospital for Sick Children: Clinical Meeting.
JULY 11.—Queensland Branch, B.M.A.: Council.
JULY 11.—South Australian Branch, B.M.A.: Council.
JULY 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JULY 16.—Victorian Branch, B.M.A.: Council.

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